Reversal Theory and Emotional and Psychophysiological Processes in Mother-Daughter Interactions

by

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Abstract

This thesis investigated the emotional and psychophysiological processes in mother-adolescent daughter dyads using reversal theory constructs (Apter, 1982) including metamotivational states, metamotivational dominances, and reversal processes.

Experiment 1 used 63 mother-daughter dyads and sought to identify the predictors of perceived conflict in the family environment and to investigate emotional processes during neutral, conflictual and pleasant conversational interactions. The results revealed associations between the perceived conflict in the family and each of parenting skills and stress, psychopathology, motivational styles, anger intensity and perceived control and organisation in the family. Also, the conversations generally reduced the levels of hedonic tone and transactional gain and increased the levels of transactional loss for the participants. The conflictual conversation induced lower levels of pleasant emotions and higher levels of the telic state, stress, and unpleasant emotions than the neutral or pleasant conversations. Daughters experienced greater levels of paratelic emotions and transactional loss than mothers, which was consistent with the mother-daughter differences in arousal-seeking, negativistic and autic-mastery dominance.

In Experiment 2, a high-conflict group (12 dyads) and a low-conflict group (12 dyads), were established on the basis of the Conflict subscale of Family Environment Scale to examine emotional changes and physiological arousal during neutral, conflictual and pleasant conversational interactions. The high-conflict group

experienced greater levels of unpleasant emotions and positive transactional emotions than the low-conflict group. There was no significant difference in sympathetic arousal between the groups. Experiment 2 also examined the metamotivational and emotional predictors of individual physiological responses during the dyadic interactions. It was found that anxiety and anger (low hedonic tone in a telic state) and excitement and provocativeness (high hedonic tone in a paratelic state) were associated with levels of sympathetic arousal of participants. Both transactional loss and gain were related to physiological responding.

In Experiment 3, the same high and low conflict dyads in Experiment 2 were used to examine the levels of physiological linkage between dyads and identify the metamotivational and emotional predictors of physiological linkage. The results indicate that the physiology of daughters predicted the responses of mothers better than vice versa. It was also shown that daughters' ratings of provocativeness and placidity were both predictive of physiological linkage. Both transactional loss and gain were related to shared physiology. For the high-conflict group, physiological linkage was stronger during the conflictual conversation than the pleasant conversation.

On the whole, the results demonstrated the utility of reversal theory constructs in explaining the interplay between the operative metamotivational state, reversal processes, motivational styles and contextual features in emotional and physiological processes in mother daughter dyads. However the verbal, non-verbal, and cognitive factors that instigate reversals remain to be investigated.

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Chapter 1

Introduction

Chapter 1

Introduction

People alter so much, that there is something new to be observed in them forever.

Pride and Prejudice

The literature on the investigation of emotional and psychophysiological processes which occur in dyadic interaction is quite limited. However, there is work which indicates that such processes warrant investigation (Di Mascio, Boyd, Greenblatt, & Solomon, 1955; Ridgeway, 1992; Levenson & Gottman, 1983; McCarron & Appel, 1971; Robinson, Herman, & Kaplan, 1982; Wagner & Calam, 1988). Previous works on client-therapist and family dyads indicate a link between physiological responses and the social interaction between the members of a dyad.

Particular types of dyads which deserve attention include married couples and parent-child dyads. Research investigating both the emotional and physiological processes in parent-child dyads is scarce. Among parent-child dyads, mother-daughter dyads with the highest level of conflict (Paikoff, Carlton-Ford, & Brooks-Gunn, 1993), increased negative affect (Montemyer, Eberly, & Flannery, 1993) and cohesion (Rossi & Rossi, 1990) require further investigation. The previous work on mother-daughter dyads, while emphasizing affective expression, is not based on a theoretical framework that could account for the complexity of emotional experience. Such complexity is difficult to elucidate, unless the subjective experience of emotions, or a phenomenological approach, is used as the frame of reference. Consideration of subjective experience is likely to reveal that the emotional response to an environmental event or bodily change depends on the operative

metamotivational state of the individual. In this regard, Reversal Theory (Apter, 1982) with its structural phenomenological approach, presents a theoretical framework which may account for the different states of mind and the processes that govern the abrupt changes in the operative state of the individual, and facilitate understanding of the dynamics of emotional process in dyadic interactions. The theory introduced metamotivational states and reversal processes and established a new perspective on the structure and dynamics of emotional experiences. Furthermore, reversal theory proposes measures of dominance, salience and individual tendencies which, in contrast with the trait theories, presents a dynamic profile of the individual's characteristics over time. In this respect, while the individual has particular orientations towards specific styles, at times he/she might act or feel differently from his/her dominant styles. This thesis is an investigation of the emotional and psychophysiological processes in mother-daughter dyads using a reversal theory framework.

The necessity of a structural phenomenological approach for the study of emotional and physiological processes in parent-child dyads might be more salient when the period of adolescence adds further complexity to the process of parent-child interaction. During adolescence, the parent-child interaction enters into a new phase which could be perceived as stressful or problematic by many families (Robin & Foster, 1989). Previous studies on parent-child dyads, on the quality of parent-child relationships during the period of adolescence and on distinct features of mother-daughter relationships are reviewed in Chapter 2. The second part of this chapter is concerned with the introduction of reversal theory and its methodology and application for the study of dyadic interaction.

The utility of reversal theory in the comparison of emotional and physiological processes is two-fold. Firstly, differences between different types of families and differences between mothers and daughters in emotional and physiological responding are better understood in the light of the operative metamotivational state of the individual and the reversal processes that occur during the interaction. Furthermore, the information regarding the metamotivational styles of the participants can be used further to illuminate the emotional processes in mother-daughter dyads. In the first section of the introduction for Experiment 1, reversal theory will be used to formulate predictions regrading the emotional processes in mother-daughter dyads during neutral, conflictual and pleasant interactions.

Perceived conflict is one of the most salient indices of the parent-adolescent relationship (Graber & Brooks-Gunn, 1999; Hall, 1987; Katz, Kramer, & Gottman, 1992; Minuchin, 1985; Powers & Welsh, 1999) and has been used to compare normal and problematic families. Perceived conflict can be applied in categorization of families within a non-clinical sample. However, the level of perceived conflict can be influenced by interpersonal and intra-individual variables within a family. There is a gap in the literature in that as yet, there has been no comprehensive study of the predictors of perceived conflict in mother-daughter dyads. The arguments regarding the predictors of perceived conflict in mother-daughter dyads present another part of hypotheses to be tested by Experiment 1. Perceived conflict in family environment was used as the basis for group selection for the subsequent experiments. The introduction, method, results and discussion of Experiment 1 are included in Chapter 3.

Chapter 4 involves the comparison of the emotional and psychophysiological processes in low-conflict and high-conflict mother-daughter dyads in response to the audio-tapes of the previous conversations. Chapters 4 is concerned with the introduction, hypotheses, method, results and discussion of Experiment 2.

Research on client-therapist dyads includes examination of correlations between relationship variables and various psychophysiological measures (Di Mascio et al., 1955; McCarron & Appel,1971; Ridgeway, 1992; Robinson et al., 1982). Studies on married couples (Levenson & Gottman,1983) and parent-child dyads (Wagner & Calam, 1988) provides evidence for the linkage of physiological responses between the members of the dyads during different kinds of interactions. However, there are some contradictions regarding the interpretation of physiological linkage as the indicator of empathy or relationship dissatisfaction. Experiment 3 is designed to overcome this ambiguity by virtue of the structural phenomenological approach of reversal theory by exploring the subjective experiences which accompany the physiological linkage between the members of the dyads from the low-conflict and high-conflict groups. The introduction, method, results and discussion of this experiment are presented in Chapter 5. The implications of the results of the three experiments are integrated within Chapter 6.

Chapter 2

Reversal Theory and Parent-Child Dyadic Interaction

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A review of previous research on parent-child dyadic interaction, on the quality of parent-child relationship during the period of adolescence and on distinct features of mother-daughter relationships will be presented and the utility of reversal theory in the investigation of the emotional and physiological processes in mother-daughter dyads will be demonstrated.

Parent-Child Dyadic Interaction

The application of system approaches to the study of families offers a move away from individual models to one in which the system rather than the individual should be the subject of study (Wagner & Calam, 1988). This approach generated new groundwork upon which the individual's affective and physiological responses to interpersonal relationships could be explored in the context of the interaction with other member(s) of the family. The following sections review research on emotional processes for parent-child, parent-adolescent child and mother-daughter dyadic interactions, and the psychophysiology of the parent-child relationship.

Emotional processes in parent-child dyadic interaction. Prior to the late 1950s, the studies on family interaction focused on the comparison of disturbed, schizophrenics and normal families, and used a variety of methods including survey questionnaires, case history analyses, psychological testing, and individual psychiatric interviews (Jacob, 1975). The methodological faults of the self-report studies regarding the lack of congruence between the reported and actual behaviour

led to the emergence of direct observation studies, in which current patterns of dyadic interaction are directly assessed and systematically coded (see Jacob, 1975).

The earlier observation studies on parent-child dyads have attempted to assess the elements of parent-child verbal interactions by analyzing recorded discussions during experimenter-determined tasks, such as the family Thematic-Apperception Test, unrevealed difference technique, or a decision-making task (see Prinz, Rosenblum, & O'Leary, 1978). In his review of the research, Jacob (1975) noted that observation categories of parent-child dyadic interaction have covered a wide range of behaviours including interrupting, conciliation, talk-time by each member, agreements, disagreements, positive and negative affect, affection, tension release, overt hostility, defensive and supportive communications, and criticism. Jacob (1975) pointed out that the inconsistencies in methodology and results made it difficult to identify measures that clearly discriminate normal, disturbed and schizophrenic families. Jacob (1975) commented that the studies lacked consistency in terms of the measurement techniques, experimental setting, diagnosis status, demographic characteristics and observer rating criteria. Prinz et al. (1978) tried to complement the earlier works by adding a written description of interactions at home to the audio-tape discussions. The written statements by the distressed mothers and adolescents revealed more personal attacks, anger and hostility, complaints about disrespect, and less enjoyment, appreciation of other and less complementary appraisal than did the normal families. According to the data, there was a positive correlation between mothers' and children's expressions of positive and negative affects.

Paterson (1982) in his studies of coercive cycles in mother-child interaction demonstrated the value of an explicitly interactional approach which allows the

representation of sequences of interactions within dyads. The line of work presented by Paterson (1982) and Prinz et al. (1978), while unravelling the emotional and coercive cycles in distressed and non-distressed parent-child affective interaction, do not present a universal structural approach to emotional experience that could account for the process of parent-child interaction irrespective of how distressed or effective the dyads are. Furthermore, the pattern of interaction is changeable over time in that the non-distressed family might engage in aggressive communication and the distressed family can have harmonious moments. The approach did not reveal the underlying mechanisms responsible for the inconsistency in parent-child affective exchange. The nature of interaction and its concomitant emotions could change as the operative mood or state of the interactants alter. Clearly, there is a need for a theoretical framework which could delineate the structures that form the different facets of the individual's operative state, their impacts on dyadic interaction, and the dynamics that determine the pattern of change in emotional experience over time. Such an approach could form a basis to examine the extent to which the different groups of families or members of dyads spend in a particular state(s) of mind and account for the variation and inconsistency of emotional experience within parent-child interaction. The need for such a theory is more salient when the period of adolescence adds further complexity to the process of parent-child interaction. During adolescence, the parent-child interaction enters into a new phase which could be perceived as stressful or problematic by many families (Robin & Foster, 1989).

Parent-adolescent relationship. Adolescence is a dynamic developmental period during which the pursuit of independence and identity serve to intensify the duration and manifestation of negative emotions (Roberts, 1999). Apter (1983)

stated that the years of mid-adolescence are a period of psychological transition in which negativism serves to preserve and develop the adolescent's sense of identity. The parent-child relationship during the transition to adolescence is typically characterized by disagreements and minor conflict over every day, mundane issues. During the period of adolescence, changes in parent-child relationship are characterised as declining parental status and influence, increasing distance of children from parents, and decreasing positive emotional exchange between parent and adolescent (Collins & Luebker, 1994). "Mutual opposition and disagreement arises naturally in connection with violations of expectations associated with age related transitions and maturational changes of the transition to adolescence" (Collins & Luebker, 1994, p. 67). The most commonly reported conflict issues between parent and adolescent involve authority, autonomy and responsibilities (Montemayor, 1983; Smetana, 1989). Self-report studies have indicated that increased conflict with parents is related to decreased warmth and emotional closeness, increased control by parent and increased adolescent striving for autonomy (Steinberg, 1990).

The individuation theory (Noack & Kracke, 1998) suggests that connectedness and individuality in the family are the pivotal constructs which form the basis for transformation of role relationships in the family. Individuality is manifested in the family through negotiation of the adolescent's striving for autonomy and distinct identity, and parental attempts to stay in control. In spite of individuality, connectedness is observed in adolescent's attempt to retain the relationship with parents, to remain open to parental advice and to seek parental endorsement (Hofer, Youniss, & Noack, 1998). The individuation theory proposes that a U-shaped distribution of socio-emotional quality of parent-adolescent

relationship is observed in that conflict between parent and adolescent increases with the onset of puberty, peaks during early or midadolescence, then declines towards the end of the adolescence (Noack & Kracke, 1998). However, Grabber and Brooks-Gunn (1999) maintained that although adaptations to the changes in roles and expectations have been identified as a source of increased conflict among adolescents and their parents, warmth and closeness are not necessarily diminished in family relations. Previous works on parent-adolescent interaction, while portraying the conflictual aspect of the relationship, include indices like time spent with parents, changing perceptions of relationships, emotional distance and yielding to parents in decision making (Graber & Brooks-Gunn, 1999). The salience of conflict and negative emotions in parent-adolescent relationship has stimulated a line of research examining the relationship between the level of perceived conflict and emotional exchanges between parents and adolescent during different stages of puberty.

A group of observational studies investigated specific types of affective expression within parent- adolescent interactions (Flannery, Montemayor, Eberly & Torquati, 1993). In a study involving conversation tasks, Montemayor et al. (1993) demonstrated a relationship between the onset of puberty and an increase in parents' and adolescents' negative affect. The findings revealed the mutual exchange of negative affect between parents and adolescents. Conger and Ge (1999) attempted to examine different views regarding the parent-adolescent relationships cited in Laursen and Collins's (1994) review of the literature. The review noted the hypothesis made by psychoanalytic models in that physical maturation during adolescence reawakens Oedipal tensions that are resolved by emotional distancing between parents and adolescents. According to the review, the sociobiological model suggests that a higher level of conflict induced by puberty serves to turn the

adolescent's attention from family members to peers and eventually to a prospective sexual partner. Finally, the review noted the cognitive-developmental model which predicts discontinuity in parent-child interaction, as increasing mental abilities during transition leads teenagers to a revaluation of parents' authority and to a higher level of perceived conflict with parents. Laursen and Collins (1994), at the end of their review, opposed the viewpoints of these theories regarding the abrupt changes of parent-adolescent relationship during puberty and advocated the social relational models of adolescent development which propose that change in parent-adolescent interaction occur slowly and primarily reflect qualities of the relationship present before adolescence.

To examine the accuracy of these different perspectives, Conger and Ge (1990) conducted their study on parent-adolescent relationship. They had noted, on the basis of Laursen and Collin's (1994) and their own review of literature, that earlier studies on age-related parent-adolescent conflict demonstrate a variety of findings ranging from increases to decreases in parent-adolescent conflict (see Conger & Ge, 1999). Conger and Ge (1999) maintained that methodological and measurement problems like cross-sectional studies, sample size, unrepresentative samples and variations in terms of applying self-report measures or observer rating could account for these inconsistent research findings. The researchers also noticed that the previous research, even when using the same methodology, varied in terms of the focus of their measures on disagreement over issues or conversational interruption. They tried to overcome these issues by conducting a longitudinal study using a large sample of 451 families comprising both parents, a son and a daughter. The family were asked to participate in two conversation tasks one regarding a general question about the family life, and the second about greatest conflict in the

family. The trained observers rated the video-tapes of the conversations in terms of conflict/hostility and cohesion/warmth/supportiveness. The research provided strong support for the notion that parent-adolescent relations undergo profound changes in the expression of positive and negative affect during early to middle adolescent years with increased hostility towards parents by both boys and girls. The findings, consistent with sociobiological and cognitive-developmental theories, demonstrated increases in conflict and hostility and decreases in warmth and cohesion between parent and child from childhood to mid-adolescence. The results also lent support to social relational models that take interactional histories into account in their prediction of later parent-adolescent relationships. Parents and adolescents who were high on conflict and hostility in the first year of the study demonstrated relative increases in these behaviours during the second and third years of study. Families with high and low levels of warmth and supportiveness demonstrated patterns of respective increases and decreases in emotional closeness.

Overall, the previous findings on parent-adolescent dyads highlight the paradoxical feature of the relationship with the adolescent striving for individuality and autonomy contrasting with his/her dependency on parents who are either accepting the autonomy of their child or attempting to control the child. It appears that previous research on the emotional processes for parent-adolescent dyads revolves around the conflict which stemmed from the adolescent's and the parent's drive for autonomy and control respectively. This trend, while being important in elucidating a major aspect of parent-adolescent affective exchange, has presented a uni-dimensional picture of parent-adolescent conflict. The extent to which parent-adolescent conflict is affected by communication skills, parenting stress, family environment, individual characteristics, psychological symptoms and other factors

have not been investigated. Examination of these factors can contribute to differentiation of groups of low-conflict and high-conflict parent-adolescent dyads. Furthermore, the mere consideration of conflict has shifted the focus of attention away from the processes which are better accounted for by variables other than the presence of conflict between the two parties. The theoretical frameworks used in previous studies were not sufficient to account for the emotional processes which are apparent in neutral or pleasant conversation. It would be useful to determine the underlying mechanism which is responsible for the presence of, for example, negative emotion during a neutral conversation or lack of positive affect during a purported to be a pleasant situation. Variables like the operative state, the level of hedonic tone in that state and the salience of particular state(s) during the time in question could affect the subjective experience. It could be interesting, for instance, to determine if the adolescent feels bored during a conversation with the parent because the interaction does not provide the optimum level of arousal for him/her, or, if a parent views the interaction with the adolescent as arousal-evoking and thus feels angry. Previous studies on parent-adolescent dyadic interaction (Flannery et al., 1993; Montemayor et al., 1993), emphasising the "situation" as the main determinant of emotions, have not taken into consideration that the nature of the interaction or the emotional concomitants might change as a function of between-dyads, between-subjects, and even within-subject differences. Also, the validity of the data comes into question because the studies were mostly on expressive aspects of emotions as rated by external observers without exploring the internal emotional changes from the individual's point of view. In this respect, the conflict between adolescent and parent and its emotional consequences can have intraindividual and interpersonal origins which should be explored by applying subjective experience as the frame of

reference. Moreover, problems exist in concentration on one aspect of affective experience and overlooking the others.

Robin & Foster(1989) commented that the nature of the parent-adolescent interaction and its underlying psychophysiological mechanisms have not been fully investigated and understood. This lack of understanding might have partly stemmed from a narrow focus on one or two aspects of emotions while neglecting the others. Dillard (1993) defines emotions as the complex pattern of responses to person-environment assessments across four conceptually distinct domains: subjective experience, action tendency, expressive behaviour, and physiology. The previous research on parent-adolescent dyads has mostly focused on behavioural and verbal components of emotions. Furthermore, it is not only the person-environment assessment that instigates the emotions, but also the person is engaged in ongoing appraisal of his/her internal changes as well. Exploration of the physiological and psychological processes in parent-adolescent interaction requires a theoretical background and methodology which can encompass the physiological, behavioural, cognitive and phenomenological aspects of dyadic interaction. For the previous studies there are other theoretical and methodological faults which lie in the fact that these studies, while focusing on the pattern of change in emotions across years of puberty, did not pay attention to the mechanism of change that occur in shorter periods of time.

The previous research on parent-adolescent dyads made the same assumption that parent-child relationships during adolescence undergo a profound change in affective expression and perceived warmth and cohesion. However, the data of previous studies also show that the adolescents frequently shift between the extremes of obedience and rebelliousness while parents vacillate between being understanding

of the developmental needs of their child and maintaining their sense of parental control (see Cogner & Ge, 1999). The structure of changes in parent-adolescent affective exchange, whether as a cognitive-developmental necessity or a continuation of the earlier parent-child relationship, is not well understood. The cross-sectional and longitudinal studies, although targeting the changes in emotional expression during different years of puberty, have not attempted to capture the momentary changes in emotional process that might be triggered by the operative state of the individual, acting in conjunction with, or independent of the contextual changes.

The theory of "storm and stress" was the first trend which tapped the concept of lability in adolescent's emotions and stimulated the early research on adolescence in the 1960s and 1970s (see Graber & Brooks-Gunn, 1999). According to this theory the stress experienced by adolescents via biological changes, situational factors and social role can lead to storminess or moodiness, rapid shifts of moods and affect, and outbursts of short-lived negative behaviour. Indeed, ample evidence indicates the effects of hormone changes on aggressive behaviour and depressive symptomatology and eating problems (see Graber & Brooks-Gunn, 1999). However, the internal mechanism of change could be active even in the absence of the afore-mentioned stressors. The premise is that the individual's emotional experience and hedonic tone is a reflection of the individual's current state of the mind and will change as the operative state changes. Furthermore, the theory of storm and stress did not suggest that parents' mood and behaviour might also be subject to change and fluctuation. It is apparent that the previous work on parent-adolescent relationships did not use a theoretical framework which could depict different structures involved in the operative state and the dynamics of changes in operative state over time.

To explore the emotional process in parent-adolescent dyads, examination of the operative states that contribute to the lability of emotional experience for parents and adolescents might be useful. The first step to explore the emotional process in the parent-adolescent dyad could be to employ a conceptual framework which, while concentrating on the subjective experience of the individual, could present structures which could account for the different operative states, for example, the negativistic state of the adolescent during rebelliousness or the imperious state of parents to maintain control. The theory should also have the capacity to explain the dynamics of change in the operational states of both the parent and the adolescent. The second step for research on emotional process in parent-adolescent dyads could be to employ a methodology which could examine both emotional and psychophysiological processes in low-conflict and high-conflict dyads during neutral, conflictual and pleasant interactions. Also, examination of predictors of perceived conflict for parents and adolescents could add further depth to the understanding of differences between groups of dyads.

Distinct emotional features of mother-daughter dyads. The assumptions about distinctiveness of four parent-child dyads (mother-daughter, mother-son, father-daughter, father-son) have been explored in a number of studies (see Russel & Saebel, 1997, for a review of research). Although the reviewed research contains many claims about the distinctiveness of relationships in the four dyads, the empirical evidence in support of many of these claims is limited (Russel & Saebel, 1997). However, the distinct features of the mother-daughter relationship (e.g., mutual helping and caring, being closely identified) have been frequently discussed in previous literature (Boyd, 1989; Russel & Saebel, 1997). According to

psychoanalytic theory, conflict in the mother-adolescent daughter relationship arises partly from co-occurrence of menarcheal onset in daughters and menopause in mothers (Obeidallah & Burton, 1999). Building on psychoanalytic approaches, neoFreudians suggest that the conflictual characteristics of mother-daughter relationship reflects tension experienced by mothers as they simultaneously push their daughters into adulthood while maintaining emotional closeness with them (Obeidallah & Burton, 1999). Bassoff (1987) described motherhood of an adolescent daughter as a stressful period of struggles with issues of separation, loss and autonomy and conflict over sexuality and expectations.

Hofer and Sassenberg (1998) conducted role play experiments for 61 mother-adolescent daughter dyads in their homes. Audio-tapes of conflictual and pleasant conversations were rated using trained observers. The researchers found that daughters who perceived themselves as striving for independence produced more counterarguments which indicated a shift in relationship quality. The pattern of these findings suggested that the speech behaviour varies more by role (mother vs. daughters) with mothers tendency to control the discourse while daughters respond. According to Graber and Brooks-Gunn (1999), conflict in the mother-daughter relationship is inevitable, given the normative demand for autonomy that girls make as they become more mature. Brody (1996) revealed that mother-daughter boundaries were more permeable than were the boundaries of other dyads within the family (e.g., father-son, father-daughter and mother-son). Her data also uncovered the association between the permeability of boundaries between family members and the intensity of expressed negative emotions. She argued that the negative affect was an attempt to restore a sense of individuation of the child which was threatened by parents' intrusion. Conger and Ge (1999) conducted a longitudinal study on

emotional changes from childhood to adolescence and found that adolescent girls expressed greater hostility toward both parents than did boys. They suggested that more rapid pubertal and social development for daughters lead to higher level of conflict at earlier ages. Moreover, there is some evidence that conflict is more frequent for the mother-daughter dyad than other family dyads. Paikoff et al. (1993) revealed that mothers and daughters differed as to rating of family climate with higher levels of conflict reported by daughters. Given the above-mentioned conflictual aspects of the mother-daughter relationship, it might seem surprising that mother-daughter dyads reported the highest rate of cohesion among other family dyads (Rossi & Rossi, 1990).

Emotional features in mother-daughter dyads could be affected by the distinct qualities of their gender. Prior research show that women are more skilled than men in attending, detecting and receiving others' emotions (Doherty, Orimoto, Singelis, Hatfield, & Hebb, 1995). The contradictory nature of the mother-daughter relationship which is both intimate and conflictual, and female sensitivity to emotions make it an interesting area of investigation.

The previous studies on mother-daughter dyads have focused on the association between perceived family climate, pubertal and menopausal transitions (reproductive asymmetry) and adjustment, and psychological symptoms (see Graber & Brooks-Gunn, 1999). The previous research on mother-daughter dyadic interactions has mostly emphasized the cognitive, verbal (Hofer & Buhl, 1998; Rossi & Ross, 1990; Graber & Brooks-Gunn, 1999) and interpersonal (Powers & Welsh,1999) aspects of the mother-daughter interaction. Little is known about the emotional and physiological aspects of the mother-daughter interaction. Furthermore, the previous studies have presented a picture of the individual

influenced by pubertal, situational and interpersonal forces. The studies of the emotional processes in mother-daughter dyadic interactions share the same features and shortcomings that have been discussed earlier, in research on parent-adolescent dyads.

Psychophysiology of the parent-child interaction. Part of the research on the psychophysiology of parent-child interaction has a clinical focus. The positive relationship between parental high-expressed emotion and their offspring's psychophysiological reactivity has been confirmed by studies on adolescent samples at risk for schizophrenia (see Valone, Goldstein, & Norton, 1984, for a review of research). Another line of research has uncovered an association between a parental history of hypertension and greater cardiovascular reactivity to interpersonal conflict (McClure & Myers, 1999). Miller, Dolgoy, Friese and Sita (1997) found a relationship between parental history of hypertension and greater levels of hostility and autonomic arousal for them. McClure and Myers (1999) suggested that risk of hypertension in families is attributed not only to biological and nutritional factors but also to the psychological climate of the family and its members' conflict and stress management skills. However, the clinical nature of the sample suggests caution regarding the generalizability of data to normotensive population.

The impact of familial factors on physiological responding of individuals has been investigated in a number of studies. A few studies uncovered the influence of genetic factors (see Ditto, 1993 for a review) and perceived family environment (Woodball & Matthews, 1989; Wright e al., 1993) on cardiovascular reactivity to different kinds of stressors. There is some evidence (DiMascio, Boyd, & Greenbaltt, 1957; Kaplan, Burch, & Bloom, 1964; Malmo, Boag, & Smith, 1957) that

interpersonal interactions can influence the autonomic nervous system (ANS) and that this effect is related to the emotional quality of the interaction (Katz et al., 1992). The effect of cohesion and adaptability in a family environment on heart rate and blood pressure during conflictual interaction has also been confirmed (Larkin, Frazer, & Semenchuk, 1996).

Another body of research focused on simultaneous physiological responses of members of dyads during dyadic interaction. Kaplan et al. (1964) found that individuals who disliked each other were more likely to show correlation in skin conductance than dyads who liked each other. Levenson and Gottman (1983) explored marital interaction in high-conflict discussion and found that physiological linkages (i.e., a measure of how well the physiological response of each member of each dyad predicts the other member's response pattern) were able to account for 59% of variance in marital satisfaction with greater linkage being associated with lower levels of marital satisfaction. A 3-year follow up study (1985) of these couples revealed that high arousal during the original laboratory discussion predicted a decline in marital satisfaction over 3 years. In their pioneering experiments, Levenson and Gottman (1983, 1985) demonstrated that physiological measures can account for a great deal of variance in characterising and explaining interaction within one family subsystem (Wagner & Calam, 1988). Wagner and Calam (1988), in their pilot study on six volunteer parents and children examined the applicability of the work on marital dyads (e.g., Levenson & Gottman, 1983) to the parent-child subsystem. Wagner and Calam (1988) revealed that, for most dyads in this small sample, the inter-heart beat interval (IBI) and skin conductance level (SCL) of the parent were predictable from the child's responses. Their data suggests that, in addition to the physiological linkage, the reciprocity of affective response, measured

by observer rating, was apparent. Wagner and Calam (1988) suggested that for future studies in this area, more analyses are required of the nature of the interaction and the way that it is perceived by participants.

Although the magnitude of evidence regarding the associations between relationship variables and psychophysiological processes during dyadic interaction is promising, problems exist in different interpretations of the relationship between affective and physiological response. The contradictory explanation of results lies partly in research methodology which attempted to infer the emotional experience from its behavioural manifestation measured by observer raters; however, the emotional and physiological responses of the individual originate from the subjective experience of individual and can not be understood without a phenomenological perspective. Second, the same level of felt arousal and autonomic activity could be appraised differently on the basis of the operative state of individual. For example, it is likely that heart rate increases during both anxiety and excitement. However, the different states of minds operative during these emotions differ in terms of the level of hedonic tone felt during the sympathetic arousal. Similarly, the simultaneous autonomic reactivity between members of dyads can not accounted for by empathy or dislike unless temporal changes in the operative state(s) confirm such explanations. Clearly, there is a need for a methodology that could assess different states of mind and the resulting emotions, while the physiological responses are recorded. In this respect, a dial rating of pleasant, unpleasant and neutral affect, such as that used by Levenson and Gottman (1983) can not sufficiently account for the complexity.

Wagner and Calam (1988) maintained that the use of psychophysiology promises to be of immediate utility in the investigation of family processes and the functional and dysfunctional systems or subsystems. Psychophysiological

responding can also be used in comparisons of parent-child dyads that are of low-conflict and high-conflict families. However, the knowledge of the structures and dynamics involved in the individual's current state of mind can enrich physiological data, especially when the lability of emotional experience in parent-adolescent dyads is concerned.

Reversal Theory

Reversal theory, as a structural phenomenological approach, provides a complete and unitary account of motivation and emotion in human personality (e.g., Apter & Smith, 1985). "The general approach of structural phenomenology starts from subjective experience and interprets behavior, or physiological processes in the light of experience" (Apter, 1989, p. 7). Apter and Smith describe the phenomenological aspect of the theory as the central focus on subjective meaning of experience. Apter and Smith maintain that reversal theory is structural as it proposes certain metamotivational states which structure experience in distinct ways on one hand, and postulates a pattern of alternation between pairs of metamotivational states over time on the other. According to the theory, there are a number of identifiable and discrete ways of experiencing world, metamotivational states, that are each associated with their own range of emotions (Apter, 1989). Reversal theory is built upon the premise that human beings are inherently inconsistent in that not only do they behave in different ways at different times in similar circumstances or behave in similar ways in diverse circumstances, but also they behave in similar ways at different times with different underlying motivations (Potocky & Murgatroyd, 1993). The theory suggests that psychological processes involve bistability rather than homeostasis, that is, two stable and mutually exclusive and exhaustive states rather

than one (Apter & Smith, 1979). It means that people can occupy one of two stable states on certain phenomenological dimensions, and that they frequently switch or reverse between the two states (Potocky & Murgatroyd). "At any given moment, which of the opposite stable points is optimal is determined by which metamotivational state is active and this changes as prevailing states change" (Frey, 1997, p. 7). Reversal theory, as a multilevel theory of motivation, proposes that the organism is not only affected by change in motivational level (regulatory process) but also by change in metamotivational level (control) which could be influenced by environmental and internal forces (Apter, 1989).

Reversal theory as a theory of motivation and personality can provide a coherent and unifying account of emotion (Apter, 1991). Apter (1988a) presented a systematic account of pleasant and unpleasant emotions, being dependent upon the operation of particular modes of consciousness. Reversal theory proposes that there are a number of metamotivational states which are identifiable and discrete ways of experiencing the world, and are each associated with their own range of emotions (Apter, 1989). Reversal theory presents a new view of the phenomenological dimension of arousal which is opposite to the homeostatic one which holds that people have a certain optimal level of arousal they try to maintain (Potocky & Murgatroyd, 1993). Reversal theory also proposes that high arousal can be experienced as unpleasant or pleasant when one is in a telic or a paratelic state respectively (Potocky & Murgatroyd, 1993). In a telic state, one is concerned with pursuing important goals, the behaviour being subsidiary and chosen to achieve the important goal. Moreover, the telic state is characterized as an arousal-avoiding, future-focused, goal-oriented and serious-minded state. In a paratelic state, the orientation is toward the behaviour and its concomitant sensation; in this case any

goal is conceived as subsidiary and essentially an excuse for the behaviour. In addition, people in paratelic state are sensation oriented, arousal seeking, present-focused, playful and spontaneous (Apter & Svebak, 1992; Potocky & Murgatroyd, 1993). In a telic state, although the individual wants to be energised enough to pursue their goal, they eschew distractions and frivolous sources of high level of arousal. Conversely, a person in a paratelic state is primarily activity-oriented, enjoying the process and the high level of arousal (Frey, 1997).

The conformist and negativistic pairs of metamotivational states concern the extent to which one temporarily conforms with or reacts against any restrictions on one's behaviour including another person's expectations, social pressure, norms, rules, regulations and traditions. The individual in a conformist state wants to conform to expectations and norms, to respect and yield to rules and regulations and to live up to and cherish traditions. When in the negativistic state, the person wants to defy other's expectations, mock norms, break rules, overthrow tradition and enjoy the perception that one is defying rules or conventions (felt negativism) (Potocky & Murgatroyd, 1993). The combination of telic/paratelic and conformist/negativistic pairs of metamotivational states produce four state combinations: telic-conformist, telic-negativistic, paratelic-conformist, and paratelic-negativistic. The telic/paratelic and negativistic/conformist states produce eight different emotions which are modulated by felt arousal. These emotions are termed "somatic emotions" (Apter, 1989). "Felt arousal is meant here to be how emotionally worked up the individual is" (Frey, 1997, p.12). These emotions are essentially different ways of experiencing one's own bodily arousal (Apter, 1988a). Low arousal in the telic-conformist state and the telic- negativistic state is associated with emotions like relaxation and placidity respectively; high arousal is experienced as anxiety and anger. Low arousal

in the paratelic-conformist state and the paratelic-negativistic state produces emotions like boredom and sullenness respectively; whereas high arousal is experienced as excitement and provocativeness (Apter, 1988a).

In addition to the eight somatic emotions, there are eight other emotions which are modulated by *felt transactional outcome*. The felt transactional outcome is the degree of gain or loss that the person experiences as a result of transactions with others (Potocky & Murgatroyd, 1993). Apter and Smith (1985) describe the mastery/sympathy and autic/alloic pairs of metamotivational states. These two pairs jointly define the person's emotions with respect to felt outcomes of a transaction. In the mastery state, one feels a need to dominate or control the other with whom he/she is interacting, and transactions are experienced as involving taking or yielding (Murgatroyd, 1985a). The person who is in a mastery-oriented state views a relationship as a power struggle and evaluates relationship outcomes in terms of winning power and control and values hardness and toughness (Frey, 1997). When people are in the sympathy state, they view the situation in terms of harmony or unity. They are focused on caring and they value tenderness and sensitivity, and transactions are experienced as giving or receiving (Potocky & Murgatroyd, 1993; Frey, 1997). The second pair of transactional states consists of the autic and alloic states. An individual in autic state is primarily focused on his or her own outcomes, whereas, for a person in the alloic state, the outcome and happiness of the other person with whom one is interacting is the matter of primary concern (Frey, 1997).

The combination of the mastery/sympathy and autic/alloic pair of states produces four transactional combinations: autic-mastery, alloic-mastery, autic-sympathy and alloic-sympathy. In mastery/autic state, gain is associated with the emotion of pride and loss with humiliation; in the mastery/alloic state, gain produces

the emotion of modesty and loss leads to shame. In the sympathy/autic state, gain produces the emotion of gratitude and loss leads to resentment; whereas in the sympathy-alloic state, gain is associated with feeling of virtue and loss with guilt (O'Connell & Apter, 1993). While at any given time the somatic emotions and transactional emotions can be experienced simultaneously, the relative strength and the salience of a particular emotion will usually cause it to predominate our experience (Apter, 1989). This is how the theory of bistability (see Apter, 1981) moves a step further towards multistability (Apter, 1988a). Now a question is raised as to how achievement of the different preferred values for the current states impinge on the level of hedonic tone.

Pleasure/displeasure and happiness/unhappiness are two kinds of positive/negative hedonic tone associated with somatic and transactional emotions respectively (Apter, 1989). The overall hedonic tone is a product of different degrees of hedonic tone related to various metamotivational dimensions in operation (Apter, 1988). This could have great implications for the parent-adolescent relationship in circumstances when, for example, the pleasure of negativity for an adolescent may overshadow his/her unhappy feeling of resentment towards a parent.

The reversal theory perspective of emotions is far beyond the simplistic account of situation-based emotions. Zautra, Potter and Reich (1997) present a context-dependent model of positive and negative affect which suggests that positive and negative affects vary in degree of independence from one another as a function of stress and other changes in informational demands, and individual differences in cognitive processing. This framework does not account for the internal structure and dynamics of emotions which might act independently of the individual's appraisal of the situation (e.g., a sudden satiation in the operative state). The context-dependent

(Zautra et al., 1997) and the cognitive-dependent models of emotion (Lazarus, 1991) are challenged by a body of evidence presenting a number of endogenous emotion-activating processes (hormone level, genetic, biological and developmental factors, and trait emotionality) that are capable of overriding environmental information in activating and regulating the emotions (see Izard & Ackerman, 1997). This list of non-cognitive factors, although comprehensive, does not include the inconsistency of the individual as an aspect of endogenous emotion-activating processes. In this respect, the reversal theory takes initiative by proposing that satiation can affect the emotional experience in its own right. The theory throws new light on some features of personal experience which might seem irrational and ambiguous even to the individual himself, and presents a powerful theoretical framework to further understanding of the complexity of emotional experience. The theory manifests the value of examining the interaction between internal forces of metamotivational states with contextual and developmental factors through the investigation of the reversal process.

The reversal process. As the metamotivational states represent the structure of the experience, the dynamic nature of this structure lies in the reversal process and the articulation of states over time (Apter, 1982). Apter (1989) proposes that the opposite pairs of states, including arousal avoiding-arousal seeking, negativism-conformity , mastery-sympathy, and autic-alloic are closely related mirror-image pairs of dimensions which are antagonistic in action and mutually exclusive. According to Apter (1989), a reversal involves a change or switch in the operative state between members of each pair, as only one of them can be operative at a given time. In this sense, people can be seen to be not only changeable over time, but self-

contradictory (Apter, 1997b). A reversal, as a switch from one metamotivational state to the opposite metamotivational state, often involves a dramatic change in one's outlook and emotional experience (Frey, 1997). Reversal from one state to the other can be triggered by contingent events (internal or external stimuli), frustration, and satiation or some combinations of these factors (Apter, 1989).

> *Contingent factors* are events and situations which, when situably interpreted by an individual, facilitate or induce a reversal. *Frustration* of all kinds in achieving the satisfaction of the prevailing system will eventually induce reversal on its own or with the help of other factors. When a person is in a particular state for a period of time without achieving the satisfaction of that state, he/she may spontaneously reverse to the opposite state. *Satiation* is an innate process which builds up in strength, even in the absence of the other factors, and will automatically induce a reversal (Apter & Svebak, 1992, p. 329).

The *lability* of a person, defined as how readily or frequently he or she moves between the two opposite states of a metamotivational pair, varies at different times (Frey, 1997). The combination of states from each metamotivational pair (operative through reversal) produces the emotional dimension which will be operative (Apter, 1989).

Dominance, salience and individual tendencies. Reversal theory challenges the assumption of consistency in personality theory by moving from the trait concept to the more complex form of consistency/inconsistency implied by the concept of *dominance* (Apter, 1989). At first glance, the reversal theory notion of dominance, might seem contradictory with its contention of inconsistency in human experience

and behaviour. "The theory does not imply that personality characteristics do not exist but it challenges the emphasis on traits which are by definition static and enduring personal characteristics, labels depicting supposedly unvarying psychological qualities" (Apter, 1989, p. 54). Reversal theory views dominance as the likelihood that a person will be in a particular state at any point in time and the extent of biases a person has for different states (Frey, 1997). There is evidence supporting a developmental change in telic dominance, with children demonstrating a skew towards the paratelic state and adults demonstrating a skew to more telic state (Murgatroyd, 1985b). Although people may be highly dominant with respect to certain states, they still reverse to other modes; however, the reversals tend to be less frequent and less stable than for the more balanced individual (Apter, 1989). By recognising the inconsistency in peoples lives, reversal theory goes much deeper than the theory of situational specificity which assumes the consistency of the individual across different occurrences of the same situation (Apter, 1989). The focus of reversal theory on intra-individual rather than inter-individual differences implies that differences between people emerge as contrasting patterns of change, rather than different fixed positions on certain dimensions (Apter & Apter-Desselles, 1993). The theory proposes that in addition to situational factors (contingency and frustration) and dominance, satiation produces a natural rhythm of alternation which affects the operative state of the individual (Apter, 1981; 1991). Implicit in the overall impact of these factors is the notion that neither dominance nor the situation can elucidate the complexity of human behaviour and emotion without taking into account the operative state at the time of investigation.

Reversal theory, in spite of rejecting the static view of personality, presents a more comprehensive picture of individual differences in metamotivational style. The

theory proposes that people not only differ in terms of their orientation towards a particular state, they also vary as to the salience of the particular pairs of state for them. Normally, at any given moment, a person's temporary motivational style is determined by one or two of the four active metamotivational states which have the greater influence on behaviour and experience and are more salient than others (Frey, 1997). For example, it is likely that across four pairs of states negativistic/conformist and mastery/sympathy pairs of state have greatest salience for adolescents and parents respectively, irrespective of their orientation towards each of the opposite states in each pair.

The reversal theory concept of *individual tendencies* is another feature that enriches common understanding of individual differences. Apter (1988a) mentioned meta-metamotivational states which would not operate on motivational variables (like felt arousal) but on the outcomes of other metamotivational processes. These meta-metamotivational states in the form of individual tendencies, such as towards optimism or pessimism, anticipate the likelihood of experiencing especial emotions (e.g., relaxation or anxiety). The states could also precipitate or facilitate the emotional outcome in the form of tendencies toward emotionality or effortfulness.

Taking together the reversal theory concepts of dominance, salience and individual tendencies, the theory defines personality as the totality of one's metamotivational states and how these are articulated over time (Frey, 1997).

The reversal theory account of tension stress and effort stress. Reversal theory broadens the understanding of stress by proposing that the operative state of the individual determines his/her appraisal of stress and its impact on his/her level of hedonic tone. Apter (1997a) described the relationship between *tension-stress* and

emotions. He maintained that for each of the metamotivational states there is both a preferred level and an actual level of important experiential variables (e.g., felt arousal for somatic emotions and felt transactional outcomes for the transactional emotions). The actual level is determined by one's situation and perception of that situation whereas the preferred level is determined by the metamotivational state itself. The experience of pleasant emotions occurs when the actual and preferred felt arousal/felt transactional outcome match and the unpleasant emotions are the result of a mismatch. The unpleasant emotions share feeling of discomfort, unhappiness, restlessness and strain referred to as tension-stress. The term *effort-stress* refers to the actual effort that people make to reduce tension-stress or the effort required to attain the preferred level of a particular phenomenological dimension (Potocky & Murgatroyd, 1993). The work needed to overcome the mismatch and cope with the situation represents a kind of stress or strain (Apter, 1997a).

Stress can be perceived differently by people in different states of mind. "That is why the level of tension and therefore hedonic tone inverted following a reversal" (Apter, 1997a, p. 26). For paratelic-dominant people who seek stimulation, lack of stress can be experienced as tension, and the stress, up to a certain level (beyond which a reversal to a telic state is likely), can be enjoyed as a *parapathic emotion* (Apter, 1988a) which occur when an unpleasant emotion is felt with high level of hedonic tone (e.g., the stress felt during dangerous sports). Conversely, telic-dominant people become more disturbed the more stress they experience. Similarly, the stress of confrontations, arguments and disagreement might be sought as an excuse for negativism, as the challenges and difficulties may provide an occasion for the display of ability, expertise and skill for a person in mastery state who longs to exercise his control and feelings of efficacy and power (Apter, 1997a).

Reversal theory and physiological responding. The phenomenological aspect of the reversal theory could lead to the assumptions that operative states, as different facets of subjective experience, are associated with physiological responses which are another aspect of emotional experience. There is growing evidence regarding the association between telic/paratelic state and dominance and physiological responses of the individual. Svebak and Murgatroyd (1985) report a steeper electromyographic activity gradient, higher tonic skin conductance, and greater thoracic respiratory amplitudes in the telic-dominant than in the paratelic-dominant subjects. Svebak (1982) exposed his students to threat (exposure to aversive electric shock) and non-threat conditions of a perceptual-motor task and revealed that the threat condition induced a telic state and higher arousal. The concomitant physiological changes were more increased tonic electromyography (EMG) and HR in threat than in non-threat condition. There is also other evidence suggesting that EMG gradient is due to the operative state (Apter & Svebak, 1989; Rimehaug & Svebak, 1987) and enhanced by telic state accompanied by increased arousal (Rimehaug & Svebak, 1987). Studies measuring respiration activities indicate higher scores for inspiratory amplitude in telic-dominant subjects and significantly greater respiration rate for telic-dominant subjects than paratelic-dominant subjects (Svebak, 1986b). The results of experiments reported by Svebak (1986a) showed that while a threat condition caused an overall increase of HR in both telic and paratelic dominant groups, there were significantly larger increases in HR with the threat of shock for the telic dominant group. This finding implies that metamotivational dominance of an individual could render his/her physiology more or less susceptible to the impact of an external stimulus.

Svebak's (1991) study of psychogenic muscle tension confirms the important role of cognition, motivation, and emotions in the biological changes and symptoms involved in back pain. He revealed that high phasic amplitudes of EMG discharges expended on impulse and in playful behaviour, as well as elevation of tonic EMG discharges expended in serious-minded behaviour, both induce musculoskletal discomfort and pain. Furthermore, Svebak found that unsuccessful efforts to cope with stressors expended in the sympathy state give rise to guilt and resentment, as well as back pain. There is also evidence showing the relationship between cortical activities and telic and paratelic dominance (see Svebak, 1985).

Overall, the studies exploring the psychophysiology of metamotivation highlight the telic and paratelic state as having distinctly different impacts on the physiological arousal of the individual. The previous findings also indicate that the telic state and threat condition both induce greater physiological changes than the paratelic state and non-threat condition. However, these studies are mostly focused on performance tasks and measure of EMG gradient. One interesting finding of one of these studies is the lack of association between changes in EMG gradient and felt arousal (Svebak, 1984). This could imply that felt arousal and muscle activity are not necessarily the same concept. Also, apart from the study on back pain (Svebak, 1991), the transactional states and emotions have received little attention. However, the results of the above-mentioned studies on the psychophysiology of metamotivation can be considered as a starting point for the investigation of the relationship between metamotivational states and physiological responding of the individual. The findings could give rise to the expectation that this line of investigation, when carried out in interpersonal contexts, can enrich the knowledge

regarding the association between metamotivational states and psychophysiological processes.

Reversal theory and study of the parent-adolescent dyadic interaction. The review of research on parent-child dyads (Jacob, 1975, Prinz et al., 1978) indicates that the impact of the intra-individual changes on the emotional outcomes during the dyadic interaction has been overlooked. The self-report studies with focusing on the memory of the previous interactions (see Jacob, 1975; Steinberg, 1990) and the observational studies with emphasizing on the expressive aspects of the interaction (Prinz et al., 1978) have not examined the operative state of the individual at the time of the interaction and the pattern of changes to the individual's metamotivational states. Nor have the studies which explored the effect of the situaltional and pubertal factors (Flannery et al.; 1993; Montemayor et al., 1993) on parent-child dyadic interaction. Thus, the empirical data on parent-child interaction is not based on a theoretical framework with a capacity to explain for the emotional outcomes which are not accounted for by the situational or developmental factors.

Reversal theory provides a phenomenological foundation for system theory approaches to social interaction, including those which occur in the family (Apter & Smith, 1985). The theory could provide the structure underlying the variation and inconsistency of emotional experience within parent-child interaction. The inconsistency in emotional experience can be explained through the examination of reversal processes.

The reversal theory concept of dominance, salience and individual tendencies can provide information that could be applied to explain the prominence of certain behaviours or affective responses for different individuals, generations, or groups of

dyads. Also, the empirical work in reversal theory has yielded various instruments/scales with capacity to measure metamotivational states such as the Telic State Measure (Svebak & Murgatroyd, 1985); to examine metamotivational dominance, for example, the Telic Dominance Scale (Murgatroyd, Rushton, Apter & Ray, 1978), the Motivational Style Profile (Apter, 1988b) and Negativism Dominance Scale (McDermott & Apter, 1988); and to investigate tension/effort-stress, somatic and transactional emotions such as The Tension and Effort Stress Inventory (Svebak, 1991).

Reversal theory provides explanations for the nature of the relationship in different family dyads. Apter and Smith (1985) elaborate the husband and wife interaction and this should be applicable to parent-child interaction. They argue that "successful and enduring intimate relationships depend on a continuing ability to synchronize reversals in opposite directions on the autic/alloic dimension" (p. 177). In other words, when both husband and wife are in a self-centered state, namely autic state, they are less likely to attend to the emotions and issues of their spouse and show optimal understanding and support. To generalise the husband and wife example to the parent-child dyad, one could assume that if parent and child are both in the mastery state they will both be attempting to dominate and take from each other; unless one of them is in the autic and the other is in the alloic state at the time in question. In which case, there would be no contradiction and a type of harmony will prevail with the autic and alloic states complementing each other. This pattern can occur when parent and child are both in sympathy states. When both parent and child are in an autic-sympathy state they both expect to be given attention and liked regardless of the other person's needs and motives. However, when one is in the autic-sympathy and the other is in the alloic-sympathy state they can complement

each other in a harmonised relationship. With respect to the sympathy state, there is one exception, where both parent and child are in alloic-sympathy state and therefore they are at peace and in harmony. The reversal theory concepts of metamotivational states and reversal process could be useful in accounting for the transitory nature of parent-adolescent relationships.

"The asymmetry and complementarity of early parent-child relationships are changed continually towards greater reciprocity, mutuality, and equality" (Hofer, Youniss, & Noack, 1998, p. 2). This pattern of change reaches to its peak during the period of adolescence when the definite rules of care-giver and child relationship transform into an ongoing dispute between two sets of values and attitudes on the part of parent and adolescent. This could give rise to the emergence of the combination of a negativistic and autic (either mastery or sympathy) state in the adolescent and an autic-mastery state in the parent. In this regard, reversal theory has developed measures which allow the examination of emotional processes while identifying the operative state during the parent-adolescent dyadic interaction. Another area that demonstrates the value of reversal theory for the study of parent-adolescent dyads is its capacity to understand the motivational styles of the individual.

The specific features of parent-adolescent relationship could contribute to the development of particular motivational styles that have great impact on the emotional outcomes for dyads. Parent and adolescent may develop motivational styles which stem from the characteristics of parent-adolescent relationship as well as aspects of individuals' dominant styles, for example, negativistic dominance and mastery dominance for adolescents and parents respectively. The reversal theory approach to individual or dyadic differences in personality goes much deeper than empirical

frameworks exploring the parent child interrelations of identical traits (same-trait similarity/dissimilarity) (see Cattel, 1982). On one hand, reversal theory presents a comprehensive picture of individual differences based on a person's dominance and salience with regard to four pairs of metamotivational states and his/her individual tendencies which operate on metamotivational processes, compared with theories which focus on few static facets of personality. On the other hand, by rejecting the concept of trait and adopting a different concept of dominance, it allows for and explains the changeability of the person over certain time periods. The reversal theory measures of dominance, salience and individual tendencies can be used to depict the motivational profile of the adolescent or the parent and differentiate two groups of high-conflict and low-conflict dyads. Moreover, reversal theory may advance the knowledge regarding the parent-adolescent and group differences in terms of psychophysiological responding.

The afore-mentioned review of psychophysiological research on family dyads suggested that the contradictory results stemmed from a lack of phenomenological and structural approach and a focus on behavioural manifestation of emotions. From the reversal theory perspective, it is suggested that a thorough investigation of individual physiological responding and physiological linkage between two members of a dyad during dyadic interaction can not be achieved without exploring the phenomenological aspect of the emotional experience. Reversal theory could shed light on such psychophysiological processes by exploring the extent to which variables such as the mismatch between parent's and child's operative state(s), or the occurrence of reversal to a new state and change in emotional experience, could account for individual physiological responses and dyadic physiological linkage. In this regard, the reversal theory measures of operative metamotivational states and

emotions may provide more useful information of the nature of emotional experience than dial rating of positive, negative and neutral affect used in some of the previous studies (Levenson & Gottman, 1983, 1985, Levenson & Ruef, 1992). The theory with its complete account of somatic and transactional emotions might elucidate the complex nature of the relationship between emotional and physiological processes. Reversal theory has the capacity to accommodate previous contradictory results regarding the relationship between physiological linkage and empathy (Levenson & Ruef, 1992) and the association between physiological linkage and marital conflict (Levenson & Gottman, 1983).

The conceptual and methodological capacity of the reversal theory may overcome the methodological limitations in previous parent-adolescent studies and introduce issues which have not been investigated in the previous research. Furthermore, the combination of reversal theory and psychophysiology of dyadic interaction may add further understanding to the complexity inherent in emotional processes for parent-adolescent dyads. To date, no study has explored the relationship between reversal theory concepts and psychophysiological processes for parent-adolescent dyads. The parent-adolescent interaction can provide a vehicle through which to examine the physiological responses associated with the operative state, the somatic and transactional emotions, hedonic tone and felt arousal. Such an examination could shed light on the results of other studies on dyadic interaction that have explored some of these variables in isolation from other factors.

Summary

Literature on the psychophysiology of parent-child/adolescent dyadic interaction is quite limited. Previous studies on the emotional processes in parent-

adolescent dyads have focused on the cognitive aspects and behavioural expression of affect, and neglected the subjective and physiological aspects of the emotional experience. The previous work does not reflect the empirical data regarding the conflictual and transitory features of the parent-adolescent relationship. Clearly, there is a need for a comprehensive theoretical framework that could account for the complexity of parent-adolescent dyadic interaction. Reversal theory, with its conceptual and methodological capacity may advance the knowledge in the area of emotional and physiological processes for parent-adolescent dyads. The reversal theory measures of the operative metamotivational states, of metamotivational dominance, somatic and transactional emotions may provide explanations for differences in emotional experience between parent and adolescent, and for the level of conflict or harmony in dyadic interactions.

This study aims to complement the knowledge in this area by investigating the dynamics of reversal theory within the process of dyadic interaction. This thesis is focused on mother-daughter dyads as these dyads, among other family dyads, demonstrated the highest level of conflict, negative affective exchange and cohesion.

Chapter 3

Experiment 1

Chapter 3

Experiment 1

The introductory arguments of Experiment 1 consist of two parts. The first part develops hypotheses for Experiment 1 regarding predictors of perceived conflict in the family environment. The second part concerns emotional processes during mother-daughter dyadic interaction.

Predictors of Perceived Conflict in the Family Environment

The arguments leading to the hypotheses regarding the predictors of the perceived conflict in the family environment will start with the rationale behind choosing this variable for the categorization of mother-daughter dyads. Afterwards, the assumptions about different group of predictor variables will be made.

Group differences in perceived conflict in the family environment. The level of perceived conflict could be used to differentiate two groups of families within a non-clinical population. The level of Perceived conflict in the family, and not just between two members of a dyad, can be a valid grouping factor because the systems perspective (Minuchin, 1985) holds that individuals are affected not only by conflict in their own relationships, but also by conflict in the relationships between other family members. Thus, high level of parent-adolescent conflict in the family has been associated with marital conflict, adolescent drug abuse, juvenile delinquency, school failure and runaways (see Hall, 1987, for a review of research). Powers and Welsh (1999) maintained that "conflict may be a necessary occurrence for optimal outcomes during specific developmental phases of transitions" (p. 8). The parent-child conflict may have constructive as well as destructive effects on the

development of children, and the way conflict is handled could either be problematic or mediate the development of adolescent's autonomy (Cox, Brooks-Gunn, & Paley, 1999). A perception of high levels of conflict in the family might be an indication that the conflict has not led to the constructive outcome. In this way, the perceived conflict can be responsible for later emotional outcomes for parent-adolescent dyads. The parent's and adolescent's perception of conflict could determine the level of distress or harmony in the parent-child relationship. Paikoff et al. (1993) revealed that mothers and daughters in their study differed as to the rating of family climate with higher levels of conflict reported by daughters. The perception of family conflict can make up the dynamic of a family system, which is composed of a multitude of sometimes divergent beliefs and expectations held by various members of the family (Grabber & Brooks-Gunn,1999). However, "The pervasiveness of conflict hindered the search for mechanism underlying conflict when it occurs" (Graber & Brook-Gunn 1999, p. 215). Accordingly, little is known about the relative contribution of the complex factors to the level of perceived conflict in the family.

Demographic factors. Demographic characteristics like education and age might play a role in heightening or attenuating the level of conflict between parent and adolescent. Mothers with a higher level of education might become familiar with better parenting styles and conflict resolution skills through reading or participation in parenting effectiveness courses. Therefore, the level of perceived conflict in the family environment could be greater for mothers with a lower level of education. Mothers' age may also be negatively associated with the level of parent-adolescent conflict. Obeidallah and Burton (1999) explored the nature of affective ties among a sample of mother-daughter dyads from families with multiple

generations of teen pregnancy. They discovered that mothers in dyads closer in age reported a lower level of closeness than did their dyadic counterparts further apart in age. Here, it is expected that the higher level of perceived conflict for mothers and daughters would be associated with lower level of age and education of mothers (hypothesis 1.1).

The frequency and intensity of conflictual issues. The frequency and intensity of conflictual issues for parents and adolescents can be regarded as a predictor of the level of perceived conflict in the family. Even though, the parent-adolescent conflict is not intense and does not necessarily diminish the bond between parent and adolescent, they both agree that these conflicts are significant (Graber & Brooks-Gunn, 1999). High frequency and intensity of conflictual issues between parent and adolescent is associated with antisocial behaviour, immaturity, and low self-esteem in the adolescent (Hill, 1985; Montemayor, 1983). Montemayor (1983) reported that parent-adolescent conflict occurred approximately twice a week in a sample of 64 grade 10 girls. According to Graber and Brooks-Gunn (1999), adolescents tend to report that the conflicts occur more frequently than do parents. It is important to examine the extent to which the frequency and intensity, average anger intensity (average frequency x intensity) of conflictual issues contributes to the level of perceived conflict in the family. In the light of previous research, it is expected that higher frequency, intensity and higher average anger intensity reported by mothers and daughters would predict a greater level of perceived conflict for mothers and daughters (hypothesis 1.2).

Parenting communication skills. The relationship between parenting communication skills and factors in the family environment has been a focus of investigation in a number of studies (see Olson, 1986). These studies revealed that poor communication, including poor tracking of others' conversation, limited attending to others, frequent interruption, and the expression of more negative feelings than positive feelings have been recognized as some of the characteristics of chaotically disengaged families. Given the effect of communication training on the reduction of hostile exchanges between married couples (Ewart, Taylor, Kreamer & Agras, 1984), communication can be construed as an indicator of the level of perceived conflict in the family environment. Apter and Smith (1979) propose that conflict between parent and child arises from incompatibility between parent and child in terms of their metamotivational state. They suggest that, to alleviate the problems caused by state opposition, parents should apply *explanation* as a way of describing the inappropriateness of the child's behaviours. In terms of parenting skills, this could be referred to as confrontation skills. Apter and Smith also contrast *effective communication* with what they call *reversal of effect* which are the communications producing the opposite effect to that intended. They argue that enforcing parenting discipline regardless of the child's mood (paratelic or negativistic) could heighten the child's paratelic or negativistic state. This issue could be relevant to the parent-adolescent dyads when parents have difficulty understanding adolescents' moods or lack sufficient skills in "*active listening*". According to Katz, Wilson and Gottman (1999), the emotion-coaching parents (in contrast to emotion-dismissing parents) provide a safe environment for the emotional expression of children through active listening, responding genuinely to and empathically during emotionally upsetting moments, and validating rather than

judging the child's feelings. A follow-up study (Wood & Davidson, 1987) revealed that parents who had gained new cognitive skills in active listening, confrontation and conflict resolution reported positive family outcomes, major changes in perspective and lasting improvement in relationships.

Bolton (1986) maintains that "when parents have not mastered skills for accurate, congruent communication, the resulting anguish, alienation, and loneliness for parents and children alike could be devastating" (p. 6). Hughson (1980) reports evidence that many parent-adolescent problems stem from communication difficulties. Using Rogerian techniques, Hughson developed a Parenting Effectiveness Training (PET) course teaching three major skills of active listening (empathic listening), confrontation skills (which includes components of assertiveness training) and conflict resolution or family problem solving skills (Wood, 1985). A summary of research on PET (see Wood) numerates the effects of PET as improved communication skills and reduction in anxiety and parents' authoritarian attitudes. Parents undergoing a PET course reported feeling less resentful and guilty (Wood). One of the aims of this study is to explore the extent to which communication skills like active listening, confrontation and conflict resolution and total patenting effectiveness (a summation of the three skills) contribute to the level of perceived conflict in the family environment. It is expected that lower levels of communication skills would predict higher levels of perceived conflict for mothers and daughters (hypothesis 1.1).

Psychopathology. The impact of psychopathology on the perceived conflict in the family can be translated into difficulties in parenting behaviour and child adjustment resulting from psychological symptoms. A number of studies (see Miller,

Cowan, Cowan, Hetherington, & Clingempeel, 1993) suggest that the influence of parents' psychopathology on their children occurs through disturbances in parenting behaviour that affect the quality of the parent-child relationship. Problematic relationships in conflicted or disorganized families are associated with increases in the probabilities of behavioural problems or disorders for parents and children (Cox & Brooks-Gunn, 1999). Coventry (1998) argues that poor parent-child interaction and parent-adolescent conflict is related to higher rates of depression in children. Miller et al. (1993) found that parental depression is related to parents' lower levels of warmth and responsiveness, and children's aggressive behaviour and other negative interpersonal behaviours. According to Rudolph, Hammen and Burge (1994), childhood depression is associated with negative parent-child interaction; and family environments that are perceived as less cohesive, less open to emotional expressiveness, more hostile and rejecting are more stressful. It has been reported that psychological symptoms result in behavioural problems during parent-child interaction. Powers and Welsh (1999) found evidence that during interaction, daughters and mothers have difficulty negotiating autonomy of daughters as a reaction to daughters' depression. Here, the aim is to explore the contribution of psychological symptoms (e.g., depression, obsessive compulsive, anxiety and paranoid ideation) (Derogatis & Melisaratos, 1983) to the level of perceived conflict reported by mothers and daughters. In view of previous findings (Rudolph et al., 1994; Powers and Welsh 1999), it is expected that higher levels of depression for mothers and daughters would predict a greater level of perceived conflict by mothers and daughters (hypothesis 1.2).

Factors in the family environment. There are a number of factors in family environments which are associated with the level of conflict in the family. Factors like cohesion and control could both be affected by and influence the level of existing conflict between parent and adolescent. Cohesion has been defined as emotional binding among family members and cohesion assists a family's adaptability in response to situational and developmental stress (Forgatch & DeGarmo, 1999). One of the aims of this study is to determine the extent to which different factors in family environment predict the level of perceived conflict for mothers and daughters. It is expected that among different factors in the family environment (e.g., cohesion, expressiveness, control, independence, organization and achievement orientation) (Moos & Moos, 1994), lower levels of cohesion and higher levels of control (due to restriction of the adolescent's autonomy) in the family environment would predict greater levels of perceived conflict reported by mothers and daughters. Furthermore, lower levels of expressiveness should impede the process of open communication and thus increase the level of perceived conflict in the family. Also, a lower degree of independence in the family would act as a barrier to the achievement of autonomy by the adolescent and escalate the level of perceived conflict (hypothesis1.2).

Parenting stress. For parents of adolescents, coping with midlife, personal, marital, and occupational stressors may affect their responses to the adolescents, and their reactivity, emotional states and levels of distractions from the tasks of parenting (Collins & Luebker, 1994). This in turn might lead to the perception of parenting as an adverse stressor that increases the level of conflict between parent and adolescent. Parenting stress is critical with respect to the development of the parent-child relationship. Larson & Gillman (1999) found that mothers with high levels of stress

were more disposed to transmit anxiety to their adolescent children. The transmission of unpleasant affect might increase the level of perceived conflict in the family as negative emotions increase parents' unfavourable evaluation of their children and lower the parents' threshold for responding in a harsh and punitive manner to the child (Dix, 1991; Jouriles & O'Leary, 1990). This study aims to determine the extent to which different sources of parenting stress (e.g., competence, isolation, attachment, health, role restriction, spouse and total parenting stress) (Abidin, 1986) contribute to the level of perceived conflict by mothers and daughters. It is hypothesised that a greater level of total parenting stress would predict a higher level of perceived conflict in the family environment (hypothesis 1.2).

Metamotivational dominance and salience, and individual tendencies. The relationship between parents' and children's personalities remains one of the most fundamental areas of concern to developmental psychologists (Cattel, 1982). There have been several empirical approaches exploring the parent child interrelations of identical traits (same-trait similarity/dissimilarity) (see Cattel, 1982). However, the trait theory presents a static picture of personality that can not account for the interpersonal and intraindividual changes that, in conjunction with contextual forces, can trigger a different facet of a person's personality. Reversal theory (Apter, 1982), by introducing the concept of dominance as the relative likelihood that a person would be in a particular state of mind, introduced a new meaning for personality. In this way, while the individual differences are recognized through the hierarchy of state preferences over time, this does not preclude the possibility of change in operational metamotivational state. Salience of the particular metamotivational pairs for the person, and the individual tendencies that affect the outcome of

metamotivational states can add further understanding to the dynamic picture of individual differences presented by reversal theory. These measures can be applied to depict the motivational profile of the individual or dyads from high-conflict or low-conflict families.

Apter and Smith (1979) and Apter (1982, 1989) postulate that many of the parent-child problems arise out of an incompatibility between family members in terms of the telic-paratelic or negativistic/conformist mode opposition. A few studies have confirmed the parents' skew towards telic and conformist mode (Murgatroyd, 1985b; O'Connor, 1992). O'Connor (1992) found that mode dominance, reversibility and arousal orientation were stronger predictors of incompatibility than mode opposition. For adolescent and parent, incompatibility may not be assumed as equivalent to parent-adolescent conflict. However, at the time of conflict, feelings of incompatibility may arise. Exploring the argument regarding mode opposition theory and O'Connor's findings are beyond the scope of this study. Here it is intended to use the previous data to postulate which constellation of dominant and salient metamotivational states and individual tendencies contribute to the higher levels of perceived conflict by mothers and daughters. It is expected that serious-mindedness and arousal-avoiding dominance of a telic parent would clash with the paratelic-adolescent's playful and arousal-seeking orientation. The parent's concern originates from the fact that excitement for the adolescent might be achieved through outings with a peer group or engaging in sexual activities or drug and alcohol use. Given the risks involved in these kind of behaviours for adolescents, the telic-dominant parent may impose strict rules and restrictions in order to protect his/her child.

The restrictions imposed by parents on adolescents might seem mortifying for the adolescent who is inclined to achieve his/her autonomy as an essential part of

his/her identity (see Apter, 1983 for description of components of self-identity). McDermott (1988a; 1988b) found that adolescents in his study were more rebellious than adults, with adults showing a skew towards the conformist mode. For the period of adolescence, negativism is manifested in a form of defiance and rebelliousness aimed at constructing the underlying personal conceptual systems of the adolescent and serving to preserve and develop his/her sense of identity (Apter, 1983). The level of perceived conflict between parent and the negativistic child might be heightened during the period of adolescence when change in the asymmetry of power is not easily accepted by parents irrespective of their mode dominance. The point which is frequently overlooked by the parents is that their adolescent child lives in a different context from the one in which they used to live and therefore parents' proposed behavioural styles might seem outdated for the adolescent and his/her peer group who are searching for their self-identity as a new generation in the course of history. An adolescent who strives to establish his/her distinctiveness and autonomy as an individual and a member of a peer group, views family norms and values as a barrier to changes underlying the formation of his/her new self-concept. The adolescent, while dealing with his/her physical development, is subject to both parents' restrictions and peer group pressure. The adolescent needs to develop self-identity by achieving independence from parents and sometimes from peer group while maintaining a positive relationship with them. In the case of conflict with parents and peer group, it might be easier for the adolescent to choose parents as the target of his/her negativism and thus give rise to a sense of conflict in the family. When the adolescent is negativistic dominant, the family rules, customs and expectations are regarded by the adolescent as opportunities for rebelliousness and negativism (Apter, 1993). This produces a paradoxical situation for the parent in that

the adolescent is neither a child nor an adult. It means that the adolescent is expected to comply with rules in the same manner as a child and yet he/she should learn to grow towards independence and adulthood.

Although parent-adolescent conflict can be common in most families, the intensity of conflict might be escalated for parents who lack enough flexibility and openness to understand the opposite frame of reference. Hasting and Grusec (1997) revealed that parents' ability to understand their children's thoughts and feelings during a disagreement has an important role in the parenting outcome. Katz et al. (1999) introduced the concept of parental emotion-coaching as parents' awareness of their own emotions and that of their children, and their willingness to value children's emotions and assist them with their emotion of anger and sadness. Katz et al. report evidence that emotion coaching parents were less negative and more positive during interaction with their children and showed less evidence of physiological stress and behavioural problems. It appears that the emotion-coaching parenting aims at shifting the focus of parents' attention from their emotions and desire for control to an understanding of the emotions of children and helping children to deal with their issues and negative feelings. An orientation towards mastery/sympathy and autic/alloic pairs of metamotivational modes appears to be very relevant to this issue and to understanding of the quality of parent-adolescent relationship. Taken together the origin of the adolescent's negativism and the value of parental emotion coaching, it can be postulated that the degree to which parents are autic-mastery or alloic-sympathy oriented has an impact on the level of conflict between parent and adolescent. It is possible that parents with autic-mastery mode dominance engage in more authoritarian parenting styles and attempt to exert more control on their adolescent child. Conversely, parents with alloic-sympathy

dominance, who recognize the adolescents' need to establish his/her identity are better able to understand their child's emotions and moods, adopting appropriate parenting styles and thus alleviating the level conflict in the family. Autic-mastery dominance of the adolescent might also make it more difficult to understand the parents' dilemma of protecting their child while leading him/her to a higher level of maturity and independence. The alloic/sympathy adolescent is more likely to comprehend the parents' perspective and feel sympathetic towards their challenges of parenting. This in turn could lead to compromise which could reduce the level of conflict between parent and adolescent (hypothesis1.3).

Emotional Processes in Mother-Daughter Dyadic Interaction

In order to make assumptions about the emotional outcomes during the mother-daughter dyadic interaction, it is important to evaluate the available studies on both the expression of affect and the subjective experience of emotion during the parent-child dyadic interaction.

Affective expression. The expression of affect within a relationship has been examined in marital and parent-child dyads. Thus, Flannery et al. (1993) conducted conflictual and pleasant conversation tasks on a sample of 85 parent-child dyads with adolescents in grades five through nine. All conversations were videotaped and transcribed verbatim for later coding. The trained observers rated the conversations on the basis of the positive, negative, neutral, mixed and altered affective expressions. They found that parents and adolescents expressed more unpleasant and less pleasant affect as pubertal status increased.

Montemayor et al. (1993), with the same sample and procedure of Flannery et al.'s (1993) study, examined the affective expressions of parent-adolescent dyads during pleasant and conflictual conversations. The results of this study indicated that parents and adolescents were more positive towards each other in pleasant conversation and negative during unpleasant conversation. However, the researchers were uncertain about the consistency of parent-adolescent behaviour across tasks in the experiment. The inconsistency in the behaviours of parents and adolescents noted during this study implies that the operative state of the parent and adolescent might change during a course of conversation. Thus, examination of the changes in the operative state of the individual would be a useful approach in research on parent-adolescent dyadic interaction.

Another feature of the previous research on parent-adolescent dyads is its focus on behavioural aspects of emotions. There are a few problems for behavioural measurement of emotions that affect its validity. Observational studies on parent-child dyadic interaction operationalized the definition of affect as a physiological or behavioural response to an event (Montemayor et al., 1993). These works have not explored emotion/affect as the subjective experience and interpretation of affective arousal. The observer's rating of behavioural expressions of emotions might only reveal the aspects of emotional experience which are manifested by facial and verbal means. Moreover, the structure and emotional salience of different observational situations may exert different demands on the participants and increase the likelihood of certain behaviours and decrease the likelihood of other behaviours (Jacob, Tennenbaum & Krahn, 1987). Finally, the previous research on parent-adolescents dyadic interaction has not captured the ebb and flow of emotional experience which is not accounted for by situational factors. Although, the longitudinal and cross-

sectional studies explored emotional changes across puberty, there is no empirical data on the pattern of changes in emotional experience that are likely to occur in a shorter time span such as within a single conversation. The fact that parent's or adolescent's emotional response to the same issue varies at different times suggests that the emotional processes should be explored in the light of the operative state at the time in question. To capture the emotional lability of the individual, there is a need for a phenomenological framework which presents a valid account of emotions by focusing on the subjective experience of emotions. Furthermore, previous studies on parent-adolescent dyads focus on hedonic tone or arousal. These approaches do not explore the impact of adolescents' negativity and arousal orientation and parents' desire for control on the parent-adolescent emotional outcomes. Accordingly, there is a need for a theory of motivation and emotion that could incorporate these underlying mechanisms and structures. To explore the depth of emotional processes in parent-adolescent, different structures involved in the existence of particular state of mind, the resulting emotions, and the dynamics of changes in emotional experience should be fully investigated.

Subjective experience of emotions for mother-daughter dyads. Parent-adolescent interaction might be distinguished from other dyadic interaction with respect to its special emotional features. Allen, Hauser, Eickholt, Bell and O'Connor (1994) revealed that the processes of establishing autonomy and relatedness with parents are linked to negative adolescent affect. The relationships between mothers and their adolescent daughters have a high rate of conflict (Paikoff, Carlton-Ford & Brooks-Gunn, 1993) and negative affective exchange (Montemayor et al., 1993) relative to other family dyads while at the same time having a closeness and

sameness as a result of gender similarity and the formation of sex role identity (Rook, Dooley, & Catalano, 1991; Doherty et al., 1995). The paradox of conflict and closeness might make mothers and daughters vacillate between extremes of harmony and antagonism during the course of an interaction. The lability of emotional experience can not be explained without a thorough knowledge of the underlying metamotivational mechanisms like operative state and reversal processes. It is also important to examine these dynamic forces in different conversation contexts which are typical of everyday life (e.g., during neutral, pleasant and conflictual conversations).

The impact of the operative metamotivational state on mother-daughter dyadic interaction. The knowledge of the operative state of the individual can deepen the understanding of the nature of emotional experience, especially if the resulting affect appear unrelated to the contextual features. According to reversal theory (Apter, 1989), the opposite pairs of dimensions including telic/paratelic and negativism/conformism for somatic emotions (based on felt arousal), and mastery-sympathy/autic-alloic for transactional emotions (based on felt transactional outcome) can set the stage for a variety of emotional experiences in a specific interactional context. For instance, the calm nature of a neutral conversation might induce relaxation in a telic state and boredom in a paratelic state, or the challenge of a conflictual conversation may produce provocativeness and anger in a paratelic-negativistic and a telic-negativistic state respectively. The combination of pairs of states can elucidate the ambiguous and unpredictable nature of parent-adolescent emotional exchange. Also, it is likely that the restriction imposed by parents may produce either humiliation for an adolescent if he/she is in an autic-mastery state or

shame if he/she is in an alloic-mastery state. For mothers, it is possible that the rebelliousness and negativity expressed by an adolescent daughter induce either guilt for mothers in an alloic-sympathy state or shame if they are in an alloic-mastery state. There is a developmental change for telic/paratelic dominance as telicism increases with age (Murgatroyd, 1985b; O'Connor, 1992). Therefore, mothers are more likely to be in the telic state and daughters in the paratelic state on the basis of their dominance. The telic/paratelic metamotivational pair are a matter of primary importance in investigation of mother-daughter emotional processes. In this respect, any differences or mode mismatches between mothers and daughters are noteworthy and relevant to the ultimate experience of moods and emotions. The degree to which one feels playful/serious-minded, spontaneous/planning ahead and arousal-seeking/arousal-avoiding has a great impact on the outcome of an interaction. It is postulated that mothers are more likely to be in a telic state than daughters (a part of hypothesis 1.4).

In addition to the operative metamotivational state, examination of the reversal process can track the ebb and flow of emotional experience. According to reversal theory, reversal to a new state occurs as a result of contingent events, frustration or satiation. A conversation topic as a contingent event or frustration (e.g., during conflictual conversation) can instigate reversal to a different state. The impact of different contexts on emotional expression in parent-adolescent relationships (Montemayor et al., 1993) give rise to the expectation that neutral, conflictual and pleasant conversations affect reversal processes and emotional outcomes differently. Svebak (1982) found that exposure to a threat condition of aversive electric shock induced reversal to a telic state. In this respect, the conflictual conversation may act as a threat condition and trigger a reversal to the telic state.

The pleasant conversation with the possibility of containing more playful and exciting contents would trigger reversal to a more paratelic sate. Therefore, it is expected that during neutral conversation mothers and daughters would maintain their initial telic or paratelic state whereas conflictual and pleasant conversation would induce reversals to a more telic or paratelic state respectively. Also, among the three conversation topics, the conflictual and pleasant conversations would produce the highest levels of telic and paratelic states respectively (hypotheses 1.5, 1.6, 1.7, 1.8 and 1.9).

Somatic and transactional emotions during mother-daughter dyadic interaction. To determine the impact of conversational contexts on emotional processes in mother-daughter dyads, it is important to examine which combination of somatic and transactional emotions represents the impact of the neutral, conflictual and pleasant conversations on the subjective experience of mothers and daughters. It is postulated that the levels of pleasant somatic and transactional emotions would be unchanged, reduced and increased during the neutral, conflictual and pleasant conversation respectively. Mothers and daughters would experience greater levels of pleasant somatic and transactional emotions during the pleasant conversation than the neutral or conflictual conversation. The levels of unpleasant somatic and transactional emotions would be unchanged, increased and reduced during the neutral, conflictual and pleasant conversation respectively. The levels of unpleasant somatic and transactional emotions would be greater during the conflictual conversation than the other two conversations (hypotheses 1.5, 1.6, 1.7, 1.8 and 1.9).

It is likely that the ratings of somatic emotions indicate different levels of tension-stress, arousal and hedonic tone. For instance, a low level of hedonic tone in

the telic state (i.e., higher levels of arousal and tension-stress) of a particular individual might be more reflected in his/her high score on anxiety than low score on relaxation). Therefore, an awareness of the overall levels of stress, arousal and hedonic tone could complements the information regarding the subjective experience of emotions. It is predicted that the neutral and pleasant conversations would not induce stress in either mothers and daughters whereas the conflictual conversation would produce it, and the conflictual conversation would also increase the levels of arousal for participants. The level of hedonic tone would increase, decrease and remain unchanged during the pleasant, conflictual and neutral conversation respectively. It is also hypothesized that both mothers and daughters would experience a greater level of stress, arousal and unpleasant hedonic tone during the conflictual conversation than the neutral or pleasant conversation. The level of hedonic tone would be greater during the pleasant conversation than the other two conversations (hypotheses 1.5, 1. 6, 1.7, 1.8 and 1.9).

Mother-daughter differences in metamotivational dominance. Information regarding the metamotivational dominance in mother-daughter dyads could be used to interpret the emotional outcomes during dyadic interaction. For example, if an adolescent is paratelic/negativistic dominant, it is more likely she will experience higher levels of provocativeness. In this respect, the mother-daughter differences in metamotivational dominance can further explain why the same interactional context has various emotional experiences for mother and daughter. Given the existing literature regarding the developmental trends in the telic (Murgatroyd, 1985b; O'Connor, 1992) and negativistic dominance (McDermott, 1988a; O'Connor, 1992),

it is hypothesized that daughters would be more paratelic and negativistic dominant than their mothers (a part of hypothesis 1.4).

Aims

1. To identify variables which best predict perceived conflict in the family environment. The variables considered include motivational styles; parenting stress; psychological symptoms; anger intensity, frequency and number of conflictual issues; parenting communication skills, demographic information, and other factors within the family environment. Perceived conflict in the family environment will be used as the between-group variable for Experiments 2 and 3.

2. To examine the dynamics of mother-daughter interactions using reversal theory concepts including the metamotivational dominance, metamotivational state, reversal between the states, and felt and preferred level of arousal.

3. To compare mothers and daughters in terms of stress, arousal, hedonic tone, tension/effort-stress from the body and external factors, operative metamotivational states, preferred and actual level of arousal, somatic and transactional emotions before and after pleasant, neutral and conflictual conversations.

Hypotheses

1.1 Higher levels of perceived conflict in the family environment would be associated with lower age and education levels, parenting skills and higher levels of parenting stress for mothers.

1.2. Higher levels of perceived conflict in the family environment would be associated with higher ratings of mothers and daughters in frequency and anger intensity

of conflict issues, depressive symptoms, and perceived control in the family environment and lower ratings of mothers and daughters in perceived cohesion, independence and expressiveness in the family environment.

1.3. Higher levels of perceived conflict in the family environment would be associated with higher levels of telic and autic-mastery dominance for mothers and paratelic, negativistic and autic-mastery dominance for daughters.

1.4. Daughters would be more paratelic and negativistic dominant than mothers, and mothers are more likely to be in a more telic state than daughters.

1.5. During the neutral conversation, changes in the operative metamotivational state, and the levels of hedonic tone, stress and emotions would be minimal, if any.

1.6. The conflictual conversation would increase the levels of the telic state, stress, arousal, unpleasant emotions and reduce the levels of hedonic tone and pleasant emotions for mothers and daughters

1.7. The pleasant conversation would increase the levels of hedonic tone, paratelic state and pleasant emotions and reduce the levels of stress and unpleasant emotions.

1.8. The levels of the telic state, stress, arousal and unpleasant emotions would be greater during the conflictual conversation than the neutral or pleasant conversation, and the lowest level of hedonic tone would be reported during the conflictual conversation.

1.9. The levels of paratelic state, hedonic tone, and pleasant emotions would be greater for the pleasant conversation than the neutral or conflictual conversation.

Method

Participants

Data were collected on 63 mothers and their adolescent daughters who were distributed from grade 9 through the first year university. To be eligible for the study both mothers and daughters had to reside together and both were required to agree, separately, to participate in the study. Neither mother nor daughter could be in psychotherapy. To access sufficient participants, the investigator approached all secondary colleges and high schools in Hobart, and recruited at the University of Tasmania and through advertisements in the local newspapers. Mothers' ages ranged from 32.9 to 55.73 (M = 44.45, SD = 4.81) and daughters' ages ranged from 13.52 to 18.65 (M = 15.0, SD = 0.85).

Measures

All the following measures are presented in Appendix A.

Demographic information sheet. This included information such as age, place of birth, education of mother and daughter, number of children in the family, occupation of the main breadwinner, and mothers' marital status. Demographic information was examined as a predictor of perceived conflict in the family environment.

Screening Measures

The Brief Symptoms Inventory (BSI) (Derogatis & Melisaratos, 1983). The Brief Symptom Inventory is a 53-item self-report symptom inventory designed to assess the level or depth of symptomatic distress currently experienced by the individual (Derogatis & Melisaratos, 1983). It comprises 9 primary symptom dimensions including somatization, obsessive-compulsive, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. In addition, there are 3 global indices of distress: the General Severity Index (GSI), the Positive Symptoms Distress Index (PSDI) and the Positive Symptom Total (PST).

The primary symptom dimensions of the BSI have shown good test-retest and internal consistency reliabilities. The correlation between all dimensions and the comparable dimensions of SCL-90-R are quite high (Derogatis & Melisaratos, 1983). The mothers' and daughters' scores on these dimension were examined as the predictor variables of perceived conflict in the family environment.

Each item of the BSI is rated on a 5-point scale of distress (0-4) , ranging from 'not-at-all' to 'extremely'. The score on each primary symptom dimension was calculated by averaging the scores on items loaded for that dimension. The General Severity Index (GSI) was obtained by averaging the scores of all 53 items. The Positive Symptom Total (PST) was obtained by counting the number of items reported (score1 = a little bit to 4 = extremely), and the Positive Symptom Distress Index (PSDI) was calculated by averaging the scores of items counted for the PST (Derogatis & Melisaratos, 1983).

The Family Environment Scale (FES) (Moos & Moos, 1994). The FES is a 90-item inventory designed to assess perceptions of family climate (Moos & Moos,

1994). It is composed of 10 subscales that measures the actual, preferred and expected social environment of families. The three forms of FES which inquire about the actual, preferred and expected family environment are called the Real Form (Form R), the Ideal Form (Form I) and the Expectation Form (Form E) respectively. The same questions are included in each of these three forms. However, the wording in each form differs so as to ask about the real, ideal and expected family environment of families. For the purpose of this study, Form R was used which measures perception of current family environment. The 10 FES subscales assess three underlying sets of dimensions: relationship (including Cohesion, Expressiveness and Conflict subscales); personal growth or goal orientation (including Independence; Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation and Moral-Religious Emphasis subscales); and system maintenance (including Organization and Control subscales).

The FES has good psychometric properties. The previous studies on the FES indicate that the validity and test-retest reliability of this measure are acceptable (Moos & Moos, 1994; Ross, Marrinan, Schattner, & Gullone, 1999)

A person's raw score on each subscale was determined by counting the numbers of items marked as being true in the family environment. A raw score of 0 indicates the absence of that characteristic in the family measured by the subscale, and a raw score of 9 demonstrates a high level of that characteristic in the family. For each dyad, a raw score was calculated by averaging mother's and daughter's raw scores. The Family Incongruence raw score was derived by summing the difference between mothers' and daughters' scores on the 10 subscales.

Parenting Stress Index (PSI) (Abidin, 1986). The PSI is a screening and diagnostic assessment instrument designed to yield a measure of the relative magnitude of stress in the parent-child system (Abidin, 1986). The measure consists of two parts: The Parent Domain and the Child Characteristic Domain. The Parent Domain score of the PSI examines some of the principal parent characteristics and the family context variables which have been identified as affecting the parent's ability as a competent care-giver to the child. It comprises seven subscales: Depression, Attachment, Role Restriction, Competence, Isolation, Spouse and Health (Abidin, 1986). The Child Characteristic Domain, while not designed to be a temperament measure, does nevertheless tap into those temperament characteristics which reveal the greatest long-term predictive ability of parent stress (Thomas & Chess, 1977; Korn, 1984). The child domain contains subscales including Distractiblity/hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood and Acceptability. In this study, Form 6 of the PSI was used. Abidin's (1986) studies provided strong support for the test-retest reliability of this measure.

For this experiment, just the items from the Parent Domain were used because the items of the Child Domain were relevant to early childhood and not adolescence. The scores obtained from each of the subscales and the Parent Domain score were used to rule out the antecedent factors related to parenting stress. Here it was intended to ensure that the scores of mothers on measures of the PSI do not exceed the cut off point considered as indicating high parenting stress (see Abidin, 1986). The mothers' scores on different subscales of the PSI were examined as predictor variables of perceived conflict in the family environment.

The PSI yields 7 scores on different subscales of the Parent Domain. The summation of these seven scores forms the total score of the Parent Domain. A measure of life stress was also obtained by counting the number of stressful life events that had occurred during the twelve month period prior to study. On the basis of the normative information, Abidin (1986) has provided a norm sheet which indicate the percentile rank of each raw score. The scores can also be compared against the cut off points considered as indicating high parenting stress (see Abidin for a description of implications of high scores). The measure of mothers' Defensive Responding was calculated by summing the mothers' score on special items (see Abidin, 1986). The mothers' score on Defensive Responding is significant if the score is 24 or less.

Parenting Skills, Anger-Intensity of Conflict issues and Motivational Styles

The scores of mothers on parenting effectiveness skills, level and intensity of conflict issues in the family and participants' metamotivational styles were measured by using the Parent-Child Response Sheet (PCRS) (Wood & Davidson, 1987), the Issues Checklist (IC) (Robin & Foster, 1989) and the Motivational Style Profile (MSP) (Apter, Mallows, & Williams, 1998) respectively.

Parent-Child Response Sheet (Wood & Davidson, 1987) (PCRS). This measure was designed to assess participants' acquisition of the three major skills during a Parenting Effectiveness Training (PET) course (Wood, 1985). The designers constructed the items using the instructor's guide for parenting effectiveness skills (Gordon, 1977). In the current study, it was used to evaluate and

rank the communication skills of mothers. This form presents mothers with six statements from children in six different situations. The mothers were asked to read the statements carefully and write down their responses as if they were confronted with the same situation. Then, the response sheets were scanned to check if the mothers stated their exact word-by-word response to the child or their speculation about the situations. In the latter case, they were instructed again and asked to complete another sheet. The PCRS were rated by two independent raters who were registered clinical psychologists. All the PCRS measures were examined as the predictors of perceived conflict in the family environment.

The mothers' written responses to the statements lead to three scores: Statements 1(a) and (b) relates to Active Listening skills, 2 (a) and (b) to confrontation skills and 3 (a) and (b) to Conflict Resolution skills. Each sentence from the responses of mothers is given a +1 or -1 score on the basis of the accordance of that sentence to a category of parenting skill or a roadblock to that category. Therefore, a score with a negative value indicates that the number of -1 points (statements demonstrating roadblocks in the parenting communication skills) has exceeded the number of +1 points (statements demonstrating the parenting effectiveness skill). Roadblocks in the parenting communication skills are statements that impede the effective parent-child communication. For example, roadblock in listening skills is demonstrated when a mother's response to her daughter's statement that "nobody like me because I am ugly" is " you are very pretty". An ideal response would be statements which indicate empathy and ask for clarification, for instance "you must feel very sad, tell me more about it". The scores with positive value indicate that the number of statements indicating the presence of the parenting skills is more than the roadblock statements. In this study, the Total

Parenting Effectiveness Scores was calculated by summing the scores of mothers on Active listening, Confrontation and Conflict Resolution.

The Issues Checklist (IC) (Robin & Foster, 1989). The IC consists of a list of 44 issues that may lead to disagreements between parents and adolescents. The IC assesses both conflictual issues and the perceived anger intensity of disputes over these issues. Parents and adolescents complete identical versions of the IC by recalling discussion of the issues such as chores and drugs. For each issue, the respondent indicates whether the issue has been broached during the previous 4 weeks. For each topic endorsed as having occurred, the respondent rates the anger intensity of the discussion on a 5-point scale ranging from calm to angry and estimates how often the topic arises (Robin & Foster, 1989). In this experiment, this form was filled out by mothers and daughters separately in order to determine the most frequent and intense issues reported by both mother and daughter as the topic of conflictual discussion. The respondents' scores on quantity, anger-intensity and anger-intensity x frequency were examined as the predictors of perceived conflict in the family environment.

The IC yields three scores for each respondent: (1) the number of issues; (2) the mean anger-intensity level of endorsed issues, and (3) the anger-intensity by frequency. This gives an estimate of anger per discussion, whereas the intensity score reflects merely the average anger per issue, regardless of frequency with which the issue was discussed (Robin & Foster, 1989).

Motivational Style Profile (MSP) (Apter, Mallows, & Williams, 1998). The Motivational Style Profile is a 70-item instrument (using five items for each of the subscales) designed to measure personality in terms of the ways individuals orientate themselves in the world as these correspond with certain psychological needs. The profile is based on a general theory of personality, motivation and emotions known as reversal theory (Apter et al.).

The MSP measures dominance in five pairs of metamotivational modes: playful/serious and arousal-seeking/arousal-avoiding, compliance/defiance, self-centered mastery/sympathy and other-centered mastery/sympathy. It should be noted that in the MSP, there are non-traditional reversal theory terms used for some of the sunscales including compliance, defiance, self-centered and other-centered which correspond to the reversal theory concepts of conformist, negativistic, autic and alloic metamotivational modes respectively. Also the serious/playful and arousal-avoiding/arousal-seeking pairs of subscales are regarded as components of the telic/paratelic pair of reversal theory metamotivational modes (e.g., Apter, 1989). For the purpose of clarity, when reporting data and analyses, the actual names of the subscales (e.g., compliance) are used, except for self-centered/other-centered modes which will be replaced by the terms autic/alloic. However, when interpreting the data and discussing the literature, the traditional reversal theory terminology is employed (e.g., conformist).

The MSP also yields the overall salience of each pair of modes within the individual's conscious experience over time (the items of each subscale and scoring sheet are presented in Appendix A). The dominance score indicates the balance between the two modes that make up a pair and salience indicates the importance that

the pair as a whole has in the individual's experience over time. The first three pairs of modes are related to somatic modes whereas the last two pairs are regarded as transactional modes. In addition to measures of dominance and salience, the MSP examines tendencies towards emotionality, effortfulness and optimism/pessimism (Apter et al., 1998). The different measures of MSP were examined as the predictor variables of perceived conflict in the family environment.

The results of test-retest reliability assessed over a twelve week period (see Apter et al., 1998) yielded substantial coefficients ($p < .001$) for all scales ranging from .53 for telic scale to .92 for alloic sympathy.

Each item required the respondent to decide how far a descriptive phrase applied to them on a temporal six point scale ranging from 1- 'never' to 6- 'always'. MSP scores give rise to three kind of profiles:1) a subscale score; 2) a dominance profile, derived by subtraction of scale pairs from the first ten subscales; and 3) a salience profile, derived by adding the five scale pairs. The salience score indicates the overall strength of the two scores taken together rather than their difference (Apter et al., 1998). The scores for individual tendencies towards optimism, pessimism, emotionality and effortfulness were obtained by adding the scores on the 5 items comprising each subscale.

Measures of Emotions and States

The Telic State Measure (TSM) (Svebak & Murgatroyd, 1985). In this study, the TSM was completed by participants before and after each conversation task. TSM was used to examine the extent to which the telic/paratelic state of participants changed as a result of being engaged in different conversations. This measure

consists of four six-point scales with descriptors at each end (playful-serious, preferred spontaneous- preferred planning ahead, felt low arousal-felt high arousal and preferred high arousal-preferred low arousal) (Svebak & Murgatroyd, 1985).

For the four TSM items, high scores indicated being more serious, being higher on preferred planning ahead/telic, and having a lower level of felt arousal and a preference for low arousal/telic, respectively (for the purpose of clarity, the score on felt arousal was taken as the inverse as the measure on the scale). The total telic state score was attained by summing the score on seriousness, planning ahead and preferred level of arousal. For the total telic state score, the higher scores indicate a more telic and lower scores indicate a more paratelic state. In this study, the preferred arousal was scored in two ways. When calculating the total telic state score, the higher scores mean preference for lower level of arousal. However, to measure the preferred arousal as an individual subscale of TSM, the higher scores mean preference for higher levels of arousal.

The Tension and Effort Stress Inventory (TESI)-State Version (Svebak, 1991).

TESI is divided into three parts to measure the experience of (a) sources of stress (external factors, own body), (b) related coping efforts in respect to external factors/ own body), and (c) a set of eight pleasant and eight unpleasant moods or emotions as described by reversal theory (Apter, 1988a). The unpleasant emotions are anxiety, boredom, anger, sullenness, humiliation, shame, resentment, and guilt and the pleasant emotions are relaxation, excitement, placidity, provocativeness, pride, modesty, gratitude, and virtue. In this experiment the mother-daughter pairs were asked to complete the TESI before and after each conversation task.

All items are scored in terms of a 7-point scale (1 = *no pressure, effort, or emotional experience;* 7 = *very much*) (Svebak & Apter, 1997).

The Visual Analogue Scales (VAS) (McCormack, Horne, & Sheather, 1988).

The VAS have been used widely and effectively to measure subjective experience and behaviour of the participants (McCormack et al., 1988), and they are suited to both within-subject repeated measurement and between-group studies (Aitken, 1969). Studies have generally reported a high level of validity and inter-rater reliability of VAS (McCormack et al., 1988). The VAS typically consists of a 100 mm line anchored at both ends with words descriptive of maximal and minimal extremes of the dimension being measured. The higher score on the above-mentioned three items indicated feeling more stressed, more aroused and higher hedonic tone. The higher scores on the three items regarding the quality of conversation and behaviour indicated the perception of the conversation and the behaviour of oneself and the other party as more real and more natural respectively.

In this study, the VAS were used to measure the participants' experience of stress (comfortable or calm-worried), arousal (sleepy-active) (King, Stanley, & Burrows, 1987) and hedonic tone (unpleasant-pleasant) before and after each conversation. After each conversation topic, the VAS were used to determine the participants' assessment of the reality of the conversation (unreal-real), their behaviour and each others' behaviour (unnatural-natural). These scales were used to control for the demand characteristics of the conversation tasks and/or the experimental setting which might affect the reality of the interaction and the natural feature of the participants' behaviour.

Procedure

Initial assessment. Each mother-daughter pair participated in one 2-hour session out of school time at either the family home or the University of Tasmania, whichever was more convenient or suitable for participants. Each pair was paid $20 for travelling expenses for coming to the university. Five mother-daughter pairs were tested in their home and the other (n = 58) pairs preferred to attend at the university. At the outset of the session, the researcher tried to establish good rapport. Then each pair was given a brief introduction to the study, each participant signed a consent form, and filled out a demographic information sheet. Then, both mother and daughter were asked to complete BSI, MSP, FIS, and IC. They were instructed not to discuss or compare responses. In addition, the PSI and PCRS were completed by mothers. Between different parts of the experiment, short coffee breaks were inserted as rest pauses.

Conversation tasks. In this section, participants took part in three 5-minute conversation tasks discussing neutral, pleasant and conflictual events. At the outset of the session, the researcher briefed the participants pointing out that the major aim of the study was to investigate and record different kind of interactions that would occur between mother and daughter. The interaction was described as a process which required the two parties to participate equally in conversation and take turns as it would not be appropriate for just one person to talk and the other to listen. The participants were then instructed to utter their views, feelings and perceptions without fear of being criticized or threatened. Then, the dyads were asked to conduct a two-minute conversation as a practice in the presence of the researcher. The topic

was either chosen by the dyad or proposed by the researcher. During and after the conversation the researcher gave necessary feedback and prompts. Then participants were asked to talk for 5 minutes on each of the neutral, conflictual and pleasant topics. The conflictual topic was one of the issues in IC that was rated by both mother and daughter as the most frequent and intense issue of discussion over the last four weeks prior to the experiment. In this respect, judgement was made by the researcher in that, among the topics with the highest frequencies, the most intensive one was chosen as the conflictual issue of discussion. The neutral topic was an event of the day with a neutral nature for both parties-it was not a stressful event like an accident on the way to the university. The pleasant topic was an event or issue which was enjoyable to discuss for both members of each dyad (e.g., music or holiday plans). Five minutes baseline preceded each conversation topic. This step was taken to eliminate or reduce the carry over effects of the previous conversation. During the five minute baseline, participants were asked to relax and think about a neutral event like making a cup of coffee or taking dog for a walk. The TSM, TESI and a number of VAS were completed after each baseline (prior to the conversation tasks) and after each conversation task. The participants were asked to rate their state ratings on these measures in terms of how they were at the moment of testing (i.e., pre/post conversation). However, it was specified that post-conversation ratings pertain to the changes in emotions and states that would emanate from the conversation. A tape recorder was used to record the conversations. To eliminate the order effects on research results the order of conversations was counterbalanced between different dyads. At the time of pre-conversation tests, the participants did not know what topic they were going to discuss. However, it was likely they could guess the nature of the third topic (e.g., the possibility of discussing a pleasant topic following the neutral

and conflictual conversations). However, this issue was dealt with by counterbalancing the order of conversations. At the end of session, the participants were debriefed.

Design

Three different designs were used to explore the different types of data yielded by this experiment. The first design involved the description of the biographic information and the mother-daughter differences (also aimed to test a part of hypothesis 1.4). The second design comprised a correlational study aimed at identifying variables, among the different clusters of biographic information, which were the significant predictors of the perceived conflict in the family environment (to test hypotheses 1.1-1.3). The third design was repeated measures design used to examine the emotional processes during the mother-daughter dyadic interaction (to test a part of hypothesis 1.4, and hypotheses 1.5-1.9). The within-subject factors were time and topic. Time was measured by comparing each participant's score on dependent variables before and after each conversation. Topic was measured by exploring the effect of each conversation topic (neutral, conflictual, pleasant) on dependent variables. Dyads were treated as the experimental unit and that mother/daughter were treated as matched-pairs were thus repeated measures in the design and statistical analyses. The dependent measures were, arousal, stress, hedonic tone, tension and effort stress from body and the external factors, the measures of telic state, and pleasant/unpleasant somatic and transactional emotions.

Data Analyses

Sample characteristics and mother-daughter differences were analyzed using means and t-tests. A series of stepwise multiple regression analyses were performed in order to validate the perceived conflict in the family environment as the between-group variable for the subsequent experiments. Among 63 dyads in Experiment 1, 12 dyads with the lowest scores on the perceived Conflict subscale of the FES and 12 dyads with the highest scores on this subscale will comprise the low-conflict and high-conflict groups respectively (as it will be mentioned in Experiment 2, the small number of dyads in each group was due to the participants' drop out). The relative contribution of demographic information, measures of conflict issues, parenting skills, metamotivational dominance/salience, individual tendencies, other measures of the family environment and psychological symptoms in contributing to the level of perceived conflict in the family environment were assessed in a number of stepwise multiple regression analyses. Due to the sensitivity of multiple regression analysis to outliers, scores three standard deviations beyond the mean scores were replaced by the mean scores (see Tabachnick & Fidell, 1989).

To analyze dyadic interactions, MANOVAs were performed as primary analyses on the following groups of dependent variables. For the TESI emotions, emotions were grouped into coherent groupings: Pleasant somatic (relaxation, excitement, placidity and provocativeness), unpleasant somatic (anxiety, boredom, anger and sullenness), pleasant transactional (pride, modesty, gratitude and virtue) and unpleasant transactional (humiliation, shame, resentment and guilt). The tension and effort-stress variables were grouped as tension/effort-stress. The visual analogue scales (stress, arousal and hedonic tone) were grouped as VAS ratings. The TSM

variables (seriousness, planning ahead , felt arousal, preferred arousal and the total telic scores) were grouped as the TSM measures.

Each of the groupings of TESI emotions was analysed by a 4 (TESI emotions) x 3 (Topic : Neutral, Conflictual and Pleasant) x 2 (Time ; Before/After) x 2 (Mother/Daughter) omnibus repeated measures MANOVA using Pillai's Trace. To locate significant effects revealed by MANOVA, individual repeated measures ANOVAs (3 topics x 2 before/after x 2 mother/daughter), with Greenhouse-Geisser corrections for repeated measures, were performed on each emotion rating. t-tests were used when necessary to identify significant effects revealed by ANOVAs on individual emotions. Tension and effort-stress were analyzed in the same way. For VAS rating a 3 (VAS ratings) x 3 (topics) x 2 (before/after) x 2 (mother/daughter) MANOVA was used. For TSM measures, a 5 (TSM measures) x 3 (topics) x 2 (before/after) x 2 (mother/daughter) MANOVA was performed. ANOVAs and t-tests were performed as necessary to locate significant effects revealed by these MANOVAs.

MANOVA is the preferred method of analysis when repeated measures are involved (Vasey & Thayer, 1987) and this analysis procedure reduces the number of primary analyses on the large number of dependent variables to control Type 1 error rate. Type 1 error rate was set at $\alpha = 0.05$ for all analyses.

Results

The results of Experiment 1 consist of the three parts. The first part concerns the sample characteristics and initial assessments. Then, the results of multiple regression analyses regarding the predictors of the perceived conflict in the family

environment will be presented. The last part involves the results of ANOVAs on different measures of emotions and metamotivational states during mother-daughter dyadic interaction.

Due to the sensitivity of multiple regression analysis to outliers, individual scores more than 3 standard deviations above or below the mean scores were replaced by mean scores (Tabachnick & Fidell, 1989).

Sample Characteristics and Initial Assessment

In this section, descriptive statistics will be used to explain the sample characteristics and the results of different kinds of questionnaires which were filled out at initial assessment. t-tests will be used to explore the mother-daughter differences in scores of some of the questionnaires which were filled out by both mothers and daughters.

Demographic information. Sixty three mother-daughter dyads participated in this experiment. Mothers' ages ranged from 32.90 to 55.73 ($M = 44.45$, $SD = 4.81$) and daughters' ages ranged from 13.52 to 18.65 ($M = 15.00$, $SD = 0.85$). Among mothers, 87.3 % were employed and 12.7% remained at home. Mothers' education ranged from grade 10 to PhD degree (M=14.16 year, $SD = 2.69$) and daughters' education ranged from grade 9 to first year in university ($M = 9.65$ year, $SD = 1.00$). Table 1 presents the percentages of mothers with different marital status; and Table 2 shows the presence of a father or stepfather in the family.

Table 1. *The Percentages of Mothers with different Marital Status (N = 63 dyads)*

The Marital Status of Mothers	Percentage
Single	1.60
Married	60.30
Widowed	3.20
Divorced	20.60
Separated but not divorced	9.50
Defacto (non-legal marriage)	4.80

Table 2. *The Percentages of different categories of families on the bases of the Presence of the Father in the Family (N = 63 dyads)*

Presence of the Fathe	Percentage
Neither father nor stepfather lives with the family	39.70
Stepfather lives in the family	7.90
Joint custody	1.60
Fathers lives with the family	50.80

Psychological symptoms. The mean scores and standard deviations of mothers and daughters on and the t-tests of mother-daughter differences in the primary symptom dimensions and the three global indices of distress (from the BSI) are presented in Table 3. The figures indicates that on average mothers and daughters reported a low intensity of psychological symptoms. t-tests indicated that daughters' score was significantly higher than mothers' score on Obsessive Compulsive, The Global Severity Index, Somatization, Hostility, Psychoticism, The Positive Symptoms Total, Phobic Anxiety and The Positive Symptom Distress Index.

Table 3. *The Mean Scores and Standard Deviations of Mothers and Daughters on, and the t-tests of Mother-Daughter Differences in Primary Symptom Dimensions and Global Distress Indices of The Brief Symptom Inventory*

Symptom Dimensions	Mothers (63)		Daughters (63)		Differences	
	M	*SD*	*M*	*SD*	*t*-value df = 62	Sig
Psychoticism	0.60	0.66	0.99	0.74	-3.97	< .001*
Somatization	0.46	0.61	0.77	0.70	-3.52	.001*
Depression	1.00	0.90	1.20	0.76	-1.46	.150
Hostility	0.73	0.75	1.17	0.88	-3.59	.001*
Phobic Ansiety	0.42	0.55	0.84	0.64	-4.64	< .001*
Obsessive Compulsive	1.08	0.70	1.32	0.82	-2.04	.045*
Anxiety	0.83	0.80	0.96	0.70	-1.21	.232
Paranoid Ideation	0.75	0.73	1.20	0.77	-4.82	< .001*
Global Severity Index	0.74	0.63	1.02	0.66	-3.10	.003*
PSDI[1]	1.41	0.46	1.72	0.47	-4.43	< .001*
PST[2]	24.22	12.82	30.88	12.81	-3.99	< .001*

Notes. [1]PSDI = Positive Symptom Distress Index. [2]PST = The Positive Symptom Total, *$p < .05$.

Perceived family environment. Table 4 presents the mean scores and standard deviations of mothers, daughters and dyads on, and mother-daughter differences in various subscales of the Family Environment Scale. The table shows that there were significant differences between mothers' and daughters' mean scores on some subscales of FES with mothers having higher scores on Cohesion, Expressiveness, Independence, Intellectual Cultural Orientation, Organization and Moral Religious Emphasis. Daughters had significantly higher scores on Conflict.

Table 4. *The Mean Scores and Standard Deviations of Mothers, Daughters and Dyads on, and the t-tests of Mother-Daughter Differences in Subscales of Perceived Family Environment*

Subscales	Mothers (63)		Daughters (63)		Dyads (63)		Mother-Daughter Differences	
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*-value df = 62	Sig
Cohesion	7.76	1.21	6.68	2.10	7.22	1.32	3.90	< .001*
Expressiveness	6.05	2.00	5.13	2.03	5.59	1.76	3.61	.001*
Conflict	2.79	2.17	4.23	2.78	3.51	2.27	-5.60	< .001*
Independence	6.79	1.17	6.26	1.45	6.53	0.99	2.40	.019*
Achievement Orientation	5.04	1.46	5.07	1.60	5.06	1.23	-0.14	.891
Intellectual Cultural Orientation	7.24	1.63	6.76	1.99	7.00	1.65	2.59	.012*
Active Recreational Orientation	6.17	1.74	5.95	2.01	6.06	1.63	0.93	.360
Moral Religious Emphasis	4.19	2.56	3.61	2.72	3.90	2.57	3.78	< .001*
Organization	5.53	1.95	4.71	2.08	5.12	1.72	3.12	.003*
Control	4.53	2.33	4.68	2.58	4.60	2.19	-0.51	.613
Dyads' Incongruence Score					14.98	5.81		

Notes. The mean scores of dyads were obtained by calculating the mean scores of the averages of the scores of mother and daughter in each dyad.. Dyads' Incongruence Score was derived by summing the difference between mothers' and daughters' scores on the 10 subscales, $*p < .05$.

The conflict measures. The Issues Checklist (Robin & Foster, 1989) was used to determine the dyads' choice of topic for conflictual conversation. Judgement was made on the intensity and frequency of conflict issues reported by mother and daughter in each pair. The issue reported by both members of each dyad as the most frequent and intense issue, was chosen as the topic of conflictual conversation. The frequency of the issue over the last 4 weeks prior to the Experiment and the intensity of that issue for each dyad was calculated by averaging the scores for mother and daughter. The frequency of conflictual issues for dyads ranged from 1 to 45 (M =12.4, SD = 10.17). Intensity was rated on a scale which ranged from1 (calm) to 5 (very angry); M = 2.72, SD = 0.97.

Table 5 presents the percentage of dyads' choices and mean intensity for the most conflictual topic for each dyad. This table indicates that issues like cleaning up the bedroom (11.1%), what the teenager eats (9.5%), fighting with brothers and sisters (9.5%) were the most frequent and intense topics reported by dyads.

Table 6 presents the ranges, mean scores and standard deviations of the three measures of Issues Checklist (i.e., quantity, anger-intensity and anger-intensity by frequency) for mothers and daughters. Pearson correlation indicated a significantly low to moderate degree of agreement between mothers' and daughters' scores on quantity, anger-intensity and anger-intensity by frequency of conflict issues. Table 7 presents correlation coefficients between mothers' and daughters' scores for the measures of the Issues Checklist.

Table 5. The Percentage of Choices and Intensity of different Issues of Conflict for Dyads

Issues of conflict	Percentage (Intensity of the Issue)
1. Telephone calls	7.90 (2.80)
2. Time for going to bed	6.30 (2.50)
3. Cleaning up bedroom	11.10 (2.70)
4. Doing homework	6.30 (2.80)
5. Putting away clothes	4.80 (2.60)
6. Using television	1.60 (1.00)
7. Cleanliness (washing , showers, brushing teeth)	1.60 (2.00)
8. Which clothes to wear	6.30 (3.25)
9. How neat clothing looks	0.00 (-)
10. Making too much noise at home	3.20 (2.50)
11. Table manners	1.60 (3.00)
12. Fighting with brothers and sisters	9.50 (3.75)
13. Cursing/swearing	1.60 (1.00)
14. How money is spent	1.60 (1.50)
15. Picking books or movies	0.00 (-)
16. Allowance	3.20 (1.50)
17. Going places without parents (shopping, movies, etc.)	1.60 (2.50)
18. Playing stereo or radio too loudly	0.00 (-)
19. Turning off lights in house	0.00 (-)
20. Drugs	0.00 (-)
21. Taking care of records, games, bikes, pets and other things	1.60 (3.00)
22. Drinking beer or other liquor	0.00 (-)
23. Buying records, games, toys, and things	0.00 (-)
24.Going on dates	0.00 (-)
25.Who should be friend	0.00 (-)
26. Selecting new clothes	0.00 (-)
27. Sex	0.00 (-)
28. Coming home on time	0.00 (-)
29. Getting to school on time	0.00 (-)
30. Getting low grades in school	0.00 (-)
31. Getting into trouble at school	0.00 (-)
32. Lying	4.80 (3.50)
33. Helping around the house	4.80 (3.60)
34. Talking back to parents	6.30 (2.50)
35. Getting up in the morning	1.60 (2.00)
36. Bothering parents when they want to be left alone	3.20 (3.00)
37. Bothering teenager when he/she wants to be alone	0.00 (-)
38. Putting feet on furniture	0.00 (-)
39. Messing up the house	0.00 (-)
40. What time to have meals	0.00 (-)
41. How to spend free time	0.00 (-)
42. Smoking	0.00 (-)
43. Earning money away from home	0.00 (-)
44. What teenager eats	0.00 (-)
	9.50 (2.30)

Note. N = 63 dyads.

Table 6. *Ranges, Mean scores and Standard Deviations for Mothers and Daughters for Quantity, Anger Intensity and Anger Intensity x Frequency of all Conflict Issues on the Issues Checklist (N = 63 dyads)*

Measures of conflict issues	Minimum	Maximum	*M*	*SD*
Quantity for mothers	1	34.00	17.20	7.40
Anger intensity for mothers	1	3.34	1.94	0.54
Anger intensity x frequency for mothers	1	3.90	2.15	0.66
Quantity for daughters	1	38.00	17.1	8.08
Anger intensity for daughters	1	4.18	2.08	0.67
Anger intensity x frequency for daughters	1	4.31	2.30	0.74

Note. The quantity of issues is the number of conflictual issues discussed at home, and the anger intensity is the mean score of the anger-intensity levels of these issues.

Table 7. *Correlation Coefficients between Mothers' and Daughters' Scores on the Frequency, Intensity, Quantity, Anger-Intensity, Anger-Intensity x Frequency of Issues of Conflict (N = 63 dyads)*

Measures	*r*	*p*
Frequency of the major issue of discussion	.42	.010
The intensity of major issue of discussion	.34	.010
Quantity of issues	.79	.010
Anger-intensity	.65	.010
Anger-intensity X frequency	.49	.010

Note. The frequency of the major issue of discussion is the number of times the major issue has been discussed over the last four weeks.

The quantity of conflictual issues was significantly greater for mothers than for daughters, $t\ (62) = 16.01,\ p < .001$.

Parenting stress. Table 8 presents the mothers' mean scores and standard deviations for different measures of PSI and their percentile ranks according to Abidin's (1986) standardised data. The table demonstrates that the mothers' mean scores on Attachment, Spouse and Isolation and Life stress (70, 60, 55 and 55

percentile) lie above 50 percentile rank which is the standard rank for the average parenting stress in normal population.

Table 8. *Mothers' Mean Scores and Standard Deviations and Percentile Ranks for different measures of Parenting Stress Index (N = 63 dyads)*

Measures of parenting stress	*M*	*SD*	%ile
Competence	27.2	5.49	40
Isolation	12.92	4.01	55
Attachment	13.67	3.03	70
Health	10.87	2.94	45
Role Restriction	16.02	4.26	30
Depression	18.95	4.67	40
Spouse	17.67	4.97	60
Parent Domain	117.44	18.44	40
Life Stress	7.68	6.56	55
Defensive Responding	34.87	7.58	—

Note. Abidin (1986) has not considered percentile ranks for Defensiveness Responding.

Parenting effectiveness skills. The mothers' responses to PCRS items were scored by two independent raters who were registered psychologists. The Pearson correlation indicated a high level of inter-rater agreement for active listening (r = 0.93, p = .010), for confrontation (r = 0.80, p = .010) and for conflict resolution skills (r = 0.77, p = .010). The two raters' scores were averaged to produce ratings for Active Listening, Confrontation and Conflict Resolution subscales. The Total Parenting Effectiveness score (TPE) was the total scores on the three subscales. PCRS measures were assessed as the predictor variables of Perceived Conflict in the family environment. Table 9 presents the descriptive data regarding the scores of mothers on the three subscales of PCRS and total parenting effectiveness score.

Table 9. *The Ranges, Mean Scores and Standard Deviations of Active Listening, Confrontation and Conflict Resolution and the Total Parenting Effectiveness Skills for Mothers (N = 63 dyads)*

Parenting Skills	Minimum	Maximum	*M*	*SD*
Active Listening	-12.50	4.50	-4.87	3.40
Confrontation	-7.00	6.50	-2.71	2.89
Conflict Resolution	-7.50	7.00	-0.62	3.16
Total Parenting Effectiveness	-20.00	12.5	-8.19	7.28

Motivational styles. This portion of the data analyses described the motivational profiles of mothers and daughters and tested the first part of the hypothesis (1.4) that daughters would be more paratelic and negativistic dominant than mothers. The descriptive data and the results of t-tests ($p < .05$) regarding the mother-daughter differences in various measures of MSP are presented in Table 10.

From table 10, the mean scores of mothers and daughters show that, on average mothers were predominantly serious-minded, arousal-avoiding, compliant and sympathetic (both autic and alloic) dominant. Daughters were predominantly serious, arousal-seeking, compliant and sympathetic (both autic and alloic) dominant (e.g., the positive value for the mean score on serious-minded-playful dominance indicates orientation towards serious dominance and the negative value shows the opposite).

Table 10. *Mothers and Daughters Mean scores and Standard Deviations for Motivational Style Profile Subscales, Dominace and Salience Scales, and t-tests on Mother-Daughter Differences (N = 63 dyads)*

	Mothers		Daughters		Differences	
	M	*SD*	*M*	*SD*	*t*-value	Sig
Motivational Style Profile					df = 62	
Subscales						
Serious-mindedness	21.62	3.18	19.79	4.06	3.13	.003*
Playfulness	17.89	2.77	19.48	3.60	-3.20	.002*
Arousal-Avoiding	20.03	3.14	18.76	3.73	2.49	.016*
Arousal-seeking	15.90	3.2	19.44	4.53	-5.23	< .001*
Defiance	11.06	2.78	13.78	4.14	-4.89	< .001*
Compliance	21.19	3.04	19.41	4.39	2.76	.008*
Autic-Matery	17.57	2.80	18.62	3.28	-2.01	.048*
Autic-Sympathy	19.67	4.36	22.29	4.65	-3.77	< .001*
Alloic-Mastery	23.22	3.50	21.70	3.94	2.90	.005*
Alloic-Sympathy	24.35	3.42	23.78	3.57	1.05	.295
Optimism	21.51	3.45	19.69	3.47	3.05	.003*
Pessimism	12.14	3.17	13.99	4.22	-2.90	..005*
Emotionality	18.90	4.42	19.22	4.14	-0.45	.653
Effortfulness	22.18	3.11	21.30	3.78	1.63	.109
Dominance						
Serious-Playful	3.73	4.05	0.31	4.95	5.32	< .001*
Arousal-Avoiding/Arousal-Seeking	4.13	4.29	-0.84	6.35	5.67	< .001*
Defiant-Compliant	-10.3	4.63	-5.92	6.64	-4.53	< .001*
Autic-Mastery/Autic-Sympathy	-2.10	4.47	-3.67	4.45	2.21	.030*
Alloic-Mastery/Alloic-Sympathy	-1.13	2.33	-1.89	2.34	1.81	.075
Salience						
Serious-Playful	39.51	4.37	39.34	5.86	0.19	.849
Arousal-Avoiding/Arousal-Seeking	35.94	4.68	38.21	5.32	-2.78	.007*
Defiant-Compliant	32.41	3.77	33.41	3.91	-1.68	.098
Autic-Mastery/Autic-Sympathy	37.24	5.79	40.90	6.70	-3.96	.001*
Alloic-Mastery/Alloic-Sympathy	47.57	6.52	45.41	7.12	2.28	.026*

*$P < .05$

From Table 10, the t-tests shows that mothers had significantly higher mean scores on optimism subscale, serious-mindedness subscale and dominance, arousal-avoiding subscale and dominance, compliance subscale, autic-mastery dominance, alloic-mastery subscale and alloic-mastery/alloic-sympathy salience than did daughters. Although the mean score on alloic-mastery dominance was greater for mothers than daughters, the difference failed to reach significance. t-tests also revealed that the means scores of daughters were significantly greater than the mean

scores of mothers for pessimism, arousal-seeking subscale, arousal-avoiding/arousal-seeking salience, defiance subscale and dominance, autic-mastery and autic-sympathy subscales and autic-mastery/autic-sympathy salience. Daughters also had greater scores on defiance-compliance salience; however, the difference failed to reach significance. The data provided partial support for the prediction that daughters would be more paratelic and negativistic dominant than mothers.

Predictors of Perceived Conflict in the Family Environment

A series of stepwise multiple regression analyses examined the predictors of the perceived conflict in the family environment (the dyads scores on Conflict subscale of The Family Environment Scale) as the criterion variable. This part of data tested the following hypotheses;

1.1. Higher levels of perceived conflict in the family environment would be associated with lower age and education levels, parenting skills and higher levels of parenting stress for mothers.

1.2. Higher levels of perceived conflict in the family environment would be associated with higher ratings of mothers and daughters in frequency and anger intensity of conflict issues, depressive symptoms, and perceived control in the family environment and lower ratings of mothers and daughters in perceived cohesion, independence and expressiveness in the family environment.

1.3. Higher levels of perceived conflict in the family environment would be associated with higher levels of telic and autic-mastery dominance for mothers and paratelic, negativistic and autic-mastery dominance for daughters.

The list of significant predictor variables of perceived conflict in family environment is presented in Table 11.

Table 11. *Summary of separate Multiple Regresssion Analyses listing the Significant Predictor Variables of Perceived Conflict in the Family Environment (N = 63 dyads)*

Predictors	*Beta*	R^2 *Change*	*F Change*	*df*	*Sig F Change*
Role Restriction for mothers	.46	0.21	16.03	1, 61	.001
Anger-intensisty x Frquency for mothers	.45	0.20	15.06	1, 61	.001
Paranoid Ideation for daughters	.44	0.19	14.41	1, 61	.001
Organization in the family environemnt for dyads	-.38	0.12	8.89	1, 61	.004
Pessimism for mothers	.33	0.11	7.54	1, 61	.008
Control in family environment for dyads	.32	0.10	6.56	1, 61	.013
Hostility symptom for mothers	.31	0.09	6.33	1, 61	.015
Conflict Resolution Skills for mothers	-.28	0.08	4.98	1, 61	.029
Playful-Serious Salience for mothers	-.26	0.07	4.32	1, 61	.042

Notes. *P*-of-*F*-to enter ≤ .05, *p*-of-*F*-to remove ≥ .10

The first analysis examined demographic information such as age and education level of mothers and daughters, as the predictor variables of perceived conflict in the family environment. None of these variables significantly predicted perceived conflict.

The next analysis assessed the scores of mothers on Parenting Effectiveness Skills (obtained from PCRS) such as Active listening, Confrontation, Conflict Resolution and Total Parenting Effectiveness skills as the predictor variables. The results showed that Conflict Resolution was the only significant variable, accounting for 8% of variance in the perceived conflict in the family environment. The rest of the variables were not significantly related to conflict. The Beta value indicated that a higher score on Conflict Resolution was associated with a lower level of the perceived conflict for dyads.

For the third regression analysis, measures of conflict issues (from Issues Checklist) were explored as the predictor variables for the perceived conflict in the family environment. The measures were the scores of mothers and daughters on the number, anger-intensity and anger-intensity x frequency of conflict issues. Anger-intensity x frequency for mothers was the only variable that was significant, accounting for 20% of variance in the perceived conflict for dyads. Examination of the Beta value revealed that greater average-intensity x frequency for mothers was related to higher level of perceived conflict in the family environment.

The fourth analysis assessed the contribution of the scores of mothers and daughters on metamotivational dominance (all five profiles of dominance derived from MSP including serious-playful, compliant-defiant, autic-mastery/autic-sympathy, and alloic-mastery/alloic-sympathy) in accounting for the level of perceived conflict in the family environment. None of the variables were significant.

Individual tendencies (MSP subscales) including optimism, pessimism, emotionality and effortfulness for mothers and daughters were examined as the predictors of perceived conflict in another multiple regression analysis. The results indicated that none of the variables were significant except for mothers' pessimism which accounted for 11% of variance. Greater levels of pessimism for mothers were associated with a higher level of perceived conflict for dyads.

In another multiple regression analysis the scores of mothers and daughters on five subscales of metamotivational salience (from MSP including serious-playful, arousal-avoiding/arousal-seeking, compliant-defiant, autic-mastery/autic-sympathy and alloic-mastery/alloic-sympathy) were examined as the predictor variables of perceived conflict for dyads. According to the results, the score of mothers on serious-playful salience was the only significant variable, accounting for 7% of variance in perceived conflict for dyads. A greater level of mothers' score on serious-playful salience was associated with a lower level of perceived conflict in the family environment.

The seventh analysis examined the contribution of measures of parenting stress (derived from PSI) in accounting for the differences in perceived conflict for dyads. The results showed that the mothers' scores on Role Restriction was the only significant variable accounting for 21% of variance. There was positive association between Role Restriction for mothers and the level of perceived conflict for dyads.

The eighth analysis assessed the other measures of family environment for dyads (10 measures from FES including Cohesion, Expressiveness, Independence, Achievement Orientation, Intellectual Cultural Orientation, Active Recreational Orientation, Moral Religious Emphasis, Control, Organization and incongruent score). The results revealed that dyads' score on Organization was the major

predictor accounting for 12% of variance in dyads' rating of perceived conflict in the family environment. Dyads' score on Control accounted for an additional 10% of variance. These two factors together accounted for 22% of variance in perceived conflict for dyads. Greater level of perceived conflict was associated with a higher level of Control and a lower level of Organization in the family environment.

The last two analyses determined the predictors of perceived conflict for dyads among the psychological symptoms (11 measures from BSI including Psychoticism, Somatization, Depression, Hostility, Phobic Anxiety, Obsessive Compulsive, Anxiety, Paranoid Ideation, The Global Severity Index, The Positive Symptom Distress Index, and The Positive Symptom Total) for mothers and daughters respectively. These analyses revealed that mothers' scores on Hostility and daughters' score on Paranoid Ideation accounted for 9% and 11% of variance in perceived conflict respectively. A greater level of perceived conflict in the family environment was associated with higher scores on these predictor variables.

Summary. Overall, the findings on multiple regression analyses did not support the hypotheses regarding the predictive values of lower age and education levels (1.1) and telic dominance of mothers (1.3), greater paratelic and negativistic dominance of daughters (1.3), and greater autic-mastery dominance (1.3) and depressive symptoms of mothers and daughters (1.2) for higher levels of perceived conflict in the family. With respect to the hypotheses concerning other groupings of predictor variables (i.e., the predictive values of lower parenting skills, higher parenting stress, greater Control and lower Independence, Cohesion and Expressiveness in the family environment and higher levels of the frequency and intensity of conflict issues for higher levels of perceived conflict), the results

provided partial support. Also, unexpected significant predictors emerged from the analyses on the groupings of individual tendencies (mothers' pessimism), metamotivational salience (mothers' serious-playful salience), factors in the family (Organization) and psychological symptoms (mothers' Hostility and daughters' Paranoid Ideation).

Psychological Responses to Neutral, Conflictual and Pleasant Topics

This portion of the data analyses tested the last six hypotheses of Experiment 1 as follows;

1.4. Mothers are more likely to be in a more telic state than daughters.

1.5. During the neutral conversation, changes in the operative metamotivational state, and the levels of hedonic tone, stress and emotions would be minimal, if any.

1.6. The conflictual conversation would increase the levels of the telic state, stress, arousal, unpleasant emotions and reduce the levels of hedonic tone and pleasant emotions for mothers and daughters

1.7. The pleasant conversation would increase the levels of hedonic tone, paratelic state and pleasant emotions and reduce the levels of stress and unpleasant emotions.

1.8. The levels of the telic state, stress, arousal and unpleasant emotions would be greater during the conflictual conversation than the neutral or pleasant conversation.

1.9. The levels of hedonic tone, and pleasant emotions would be greater for the pleasant conversation than the neutral or conflictual conversation.

The results of ANOVAs on different ratings of VAS, TSM and TESI were used to explore these hypotheses. The main effect for mother/daughter tested the predicted mother-daughter differences in telic/paratelic state and explored mother-daughter differences in various ratings of VAS and TESI. The main effect for topic explored the

hypotheses regarding the differences in the levels of each rating across the three topics. The hypotheses regarding the impact of each conversation topic on changes in each of the ratings from before to after each conversation were examined by the time x topic interaction. This interaction also explored differences in preconversation and/or postconversation ratings of each measure across the three topics. The main effect for time provided additional information (not a part of hypotheses) regarding the overall changes in each rating from before to after all conversations (overall impact of all conversations). The mother/daughter x time interaction did not test any hypotheses but provided extra information regarding differences in preconversation and/or postconversation overall ratings (all conversations) between mothers and daughters, and for changes in each rating from before to after all conversation for mothers and/or daughters. The topic x mother/daughter interaction will provide additional information (not testing the hypotheses) concerning the specific impact of topic on ratings of mothers and/or daughters, and differences in ratings of mothers and/or daughters across the three topics. For the purpose of clarity, in the following subsections of data, each of the above-mentioned hypotheses will be broken down to describe the specific part of each hypothesis which is relevant to each subsection of data.

Psychological ratings of stress, arousal and hedonic tone. This subsection of the data analyses tested the hypotheses that the conflictual conversation would increase the levels of stress and arousal (1.6), the pleasant conversation would increase the level of hedonic tone for the participants and the neutral conversation will not affect the levels of stress and hedonic tone (1.7). Also, among the three conversation topics, the conflictual conversation would produce the highest levels of stress and arousal (1.8) while hedonic tone would be at its highest level during the

pleasant conversation (1.9). Table 12 presents mean scores and standard deviations for stress (calm-worried scale), arousal (sleepy-active scale), hedonic tone (unpleasant-pleasant scale), quality of conversation (unreal-real) and the behaviour of mother and daughter (natural-unnatural) before and after each conversation topic.

For VAS ratings of arousal, stress and hedonic tone, the MANOVA showed significant effects for VAS rating, Pillai's Trace = .861, F (2, 61) = 189.29, $p < .001$, and mother/daughter, Pillai's Trace = .134, F (1, 62) = 9.62, $p = .003$. There were significant interactions for VAS rating x mother/daughter, Pillai's trace = .254, F (2, 61) = 10.39, $p < .001$, VAS rating x topic, Pillai's Trace = .234, F (4, 59) = 4.51, $p = .003$, mother/daughter x topic, Pillai's Trace = .114, F (2, 61) = 3.92, $p = .025$, and VAS rating x time x topic, Pillai's Trace = .202, F (4, 59) = 3.73, $p = .009$. VAS ratings of stress, arousal and hedonic tone were greater for mothers than daughters (M = 55.43, SD = 6.57; M = 52.35, SD = 6.77). To locate significant effects revealed by MANOVA separate ANOVAs were performed for each of the VAS ratings. The list of significant main effects and interactions of these ANOVAs is displayed in Table 13.

Table 12. *Mean Scores and Standard Deviations of Psychological Ratings of Mothers and Daughters Before and After each Conversation Topic, and Ratings of Quality of Conversations After each Topic (N = 63 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Subscales		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Psychological Ratings													
Stress	-Before	25.50	22.33	28.21	19.91	26.70	18.94	25.70	21.54	22.97	18.74	23.38	18.29
	-After	20.24	15.86	22.95	17.69	29.78	22.12	30.10	24.70	21.46	17.91	25.59	24.05
Arousal	-Before	61.30	24.25	55.78	22.57	67.02	19.95	55.56	21.96	67.81	21.47	53.57	26.00
	-After	65.46	20.91	56.94	24.10	69.46	19.66	57.59	22.29	68.28	19.04	56.11	24.05
Hedonic Tone	-Before	78.97	16.06	74.65	18.84	76.01	15.74	73.13	18.54	73.87	21.81	77.90	17.62
	-After	76.83	16.85	77.43	19.28	70.37	18.80	66.27	22.11	75.71	15.58	81.41	16.21
Rating of Conversations													
The Reality of Conversation	-After	77.56	23.54	73.16	21.76	75.65	25.53	72.40	25.46	75.81	23.46	71.24	26.82
The Behaviour of Oneself	-After	79.10	18.75	75.59	22.85	76.03	21.00	79.37	17.81	78.32	16.97	74.63	23.27
The Behaviour of the Other	-After	80.29	17.71	74.25	21.57	79.06	21.52	73.08	24.94	76.92	22.59	72.33	28.04

Table 13. *Signficant Main Effects and Interactions for the ANOVAs on Psychological Ratings of Stress, Arousal and Hedonic Tone (N = 63 dyads)*

Psychological Ratings	Significant Main Effects and Interactions	*F*	df	*p*
Stress	Topic	4.19	1.96, 121.66	.018
	Time x Topic	4.69	1.95, 120.58	.012
Arousal	Mother/Daughter	19.61	1, 62	< .001
Hedonic Tone	Topic	11.39	1.69, 104.97	< .001
	Mother/Daughter x Topic	6.29	1.96, 121.46	.003
	Time x Topic	6.28	2.00, 123.78	< .001

Note. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures.

For stress, the ANOVA yielded a main effect for topic, but not for mother/daughter or time. There was a significant time x topic interaction, and the means are graphed in Figure 1. t-tests revealed that there was no significant difference in stress between the neutral conversation (M = 24.23, SD = 13.03) and the conflictual (M = 28.07, SD = 13.33) or pleasant conversation (M = 23.35, SD = 13.64). However, stress was significantly greater for the conflictual conversation than the pleasant conversation, t (62) = 2.62, p = .011. To interpret the topic x time interaction, t-tests were performed and showed that stress did not differ significantly before and after the conflictual or pleasant conversation. However, stress decreased significantly from before to after the neutral conversation (M_{pre} = 26.87, SD = 16.43; M_{post} = 21.60, SD = 13.01), t (62) = 2.97, p = .004. The t-tests also revealed that there were no significant differences in preconversation stress across the three conversation topics. However, postconversation stress was significantly greater for the conflictual conversation (M = 29.94, SD = 19.05) than the neutral, t (62) = -3.40, p = .001, or pleasant conversation (M = 23.52, SD = 16.64), t (62) = 2.32, p = .024; with no significant difference between neutral and pleasant conversation.

For arousal, there was a main effect for mother/daughter but not for topic or time. There was no significant interaction. Arousal was significantly greater for mothers (M = 66.56, SD = 14.47) than daughters (M = 55.92, SD = 17.99).

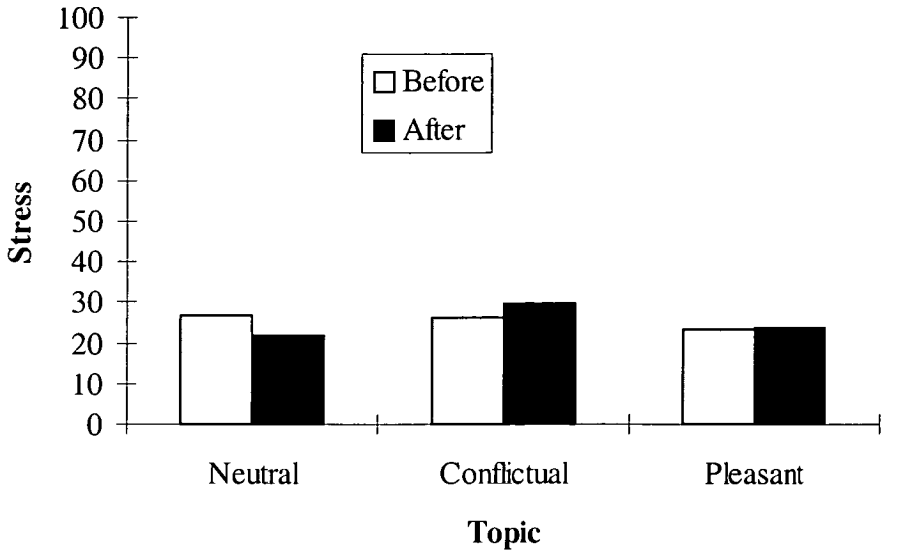

Figure 1. Mean Scores for Stress Before and After each Conversation Topic.

The ANOVA conducted for hedonic tone yielded a main effect for topic but not for mother/daughter or time. There were significant interactions for mother/daughter x topic and topic x time. The mean scores for hedonic tone of mothers and daughters for each topic are graphed in Figure 2. t-tests revealed that hedonic tone was significantly lower for the conflictual conversation (M = 71.44, SD = 12.92) than the neutral (M = 76.97, SD = 11.93), t (62) = 4.58, $p < .001$, or pleasant conversation (M = 77.23, SD = 12.76), t (62) = -3.54, p = .001. There was no significant difference in hedonic tone for the neutral and pleasant conversation. To interpret mother/daughter x topic and time x topic interactions, t-tests were performed. For the time x topic interactions, the t-tests revealed that hedonic tone did not differ significantly before and after the neutral or pleasant conversation. However, hedonic tone decreased significantly from before to after the conflictual conversation (M_{pre} = 74.57, SD = 13.15; M_{post} = 68.32, SD = 16.77), t (62) = 3.20, p = .002. Furthermore, there were no significant differences in preconversation hedonic

tone across the three conversation topics; but postconversation hedonic tone was significantly lower for the conflictual conversation than the neutral (M = 77.23, SD = 13.19) , t (62) = 4.92, p < .001, or pleasant conversation (M = 78.56, SD = 12.91), t (62) = -4.87, p < .001; with no difference between neutral and pleasant. With respect to the mother/daughter x topic interaction, t-tests showed that there was no significant difference in hedonic tone between mothers and daughters during the conflictual or neutral conversation. For the pleasant conversation, the difference between hedonic tone of mothers (M = 74.79, SD = 16.89) and daughters (M = 80.00, SD = 15.24) failed to reach significance, t (62) = -1.97, p = .053. Hedonic tone of mothers did not differ significantly for the conflictual and pleasant or neutral and pleasant conversations. However, hedonic tone of mothers was significantly greater for the neutral conversation (M = 77.90, SD = 13.95) than the conflictual conversation (M = 73.19, SD = 13.84), t (62) = 2.79, p = .007. For daughters, hedonic tone was significantly lower for the conflictual conversation (M = 69.70, SD = 18.17) than the neutral (M = 76.04, SD = 17.43), t (62) = 3.83, p < .001, or pleasant conversation (M = 79.66, SD = 15.24), t (62) = -5.27, p < .001, and hedonic tone was significantly greater for the pleasant conversation than the neutral conversation, t (62) = -2.57, p = .013.

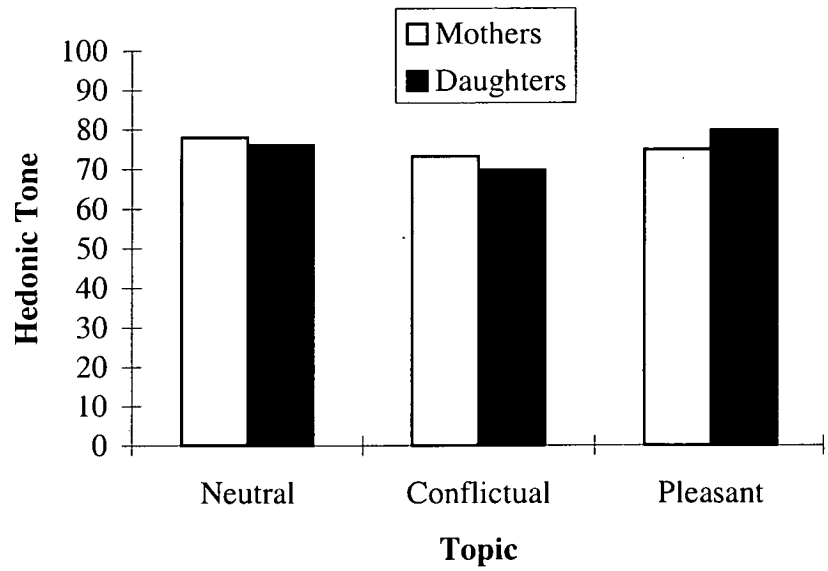

Figure 2. Mean Scores of Hedonic Tone for Mothers and Daughters for each Topic.

The results regarding the attitudes of mothers and daughter towards the reality of conversations showed that, on average, mothers and daughters viewed the conversations as highly representative of the reality. An ANOVA was used to examine the differences between the rating of mothers and daughters across the three conversation topics. There were no significant main effects or interactions.

The mean scores for attitudes towards own behaviour indicate that mothers and daughters perceived their own behaviour as natural. An ANOVA was used to assess the differences between the rating of mothers and daughters across the three conversation topics. There were no significant main effects or interactions.

With respect to the perception of the other party's behaviour, the mean scores indicate that both mothers and daughters viewed the behaviour of each other as natural. An ANOVA was conducted to examine the differences between the rating of mothers and daughters across the three conversation topics. The ANOVA yielded a main effect for mother/daughter, F (1,62) = 4.61, p = .036, but not for topic. There

was no significant interaction. Mothers perceived their daughters' behaviour as more natural (M = 78.76, SD = 13.91) than daughters perceived their mothers' behaviour (M = 73.22, SD = 18.53).

Summary. The ANOVAs on stress, arousal and hedonic tone did not support the hypotheses regarding the impact of the conflictual conversation on increasing the levels of stress and arousal (1.6), and the effect of the pleasant conversation on increasing the level of hedonic tone (1.7). However, the lack of impact of the neutral conversation on these ratings was consistent with the prediction (1.5). Although the salience of the conflictual conversation in producing the highest level of arousal was not supported by the data, the lowest level of hedonic tone and the highest level of stress during this conversation were in predicted directions (1.8). The hypothesis (1.9) regarding the highest level of hedonic tone during the pleasant conversation was only confirmed for daughters. The ANOVAs also provided additional information. The only mother/daughter difference was that mothers experienced greater levels of arousal than did daughters. The ratings of quality of conversations revealed that both mothers and daughters rated their behaviours to be natural and the conversation to be real. However, mothers rated their daughters' behaviour as more natural than daughters rated their mothers' behaviour.

Measures of telic/paratelic state. This subsection of the data analyses tested the hypotheses that the level of telic state would increase, decrease and remain unchanged during the conflictual, pleasant and neutral conversations respectively (1.5, 1.6 and 1.7), and the level of felt arousal will increase during the conflictual conversation (1.6). This part of data also examined the predictions regarding the

highest levels of telic and paratelic states during the conflictual and pleasant conversations respectively (1.8 and 1.9), and that mothers would be more likely to be in a telic state than daughters (1.4). Table 14 presents the mean scores and standard deviations of different subscales of the TSM for mothers and daughters before and after each conversation topic. It should be noted that the higher scores for felt arousal and preferred arousal indicate higher levels of actual felt arousal and preference for higher levels of arousal respectively.

The 5 (TSM Measures)x 3 (Topic) x 2 (Time) x 2 (Mother/Daughter) MANOVA for the TSM subscales showed significant effects for TSM, Pillai's Trace = 1.00, F (4, 59) = 46.44, $p < .001$, and for topic, Pillai's Trace = .292, F (2, 61) = 12.60, $p < .001$. There were significant interactions for TSM x mother/daughter, Pillai's Trace = .150, F (4, 59) = 2.61, $p = .045$, TSM x time, Pillai's Trace = .172, F (4, 59) = 3.06, $p = .023$, mother/daughter x time, Pillai's Trace = .069, F (1, 62) = 4.57, $p = .036$, TSM x topic, Pillai's Trace = .339, F (8, 55) = 3.53, $p = .002$, TSM x mother/daughter x topic, Pillai's Trace = .240, F (8, 55) = 2.18, $p = .044$, time x topic, Pillai's Trace = .148, F (2, 61) = 5.31, $p = .007$, TSM x time x topic, Pillai's Trace = .388, F (2, 61) = 4.36, $p < .001$, and TSM x mother/daughter x time x topic, Pillai's Trace = .258, F (8, 55) = 2.39, $p = .028$. To locate significant effects revealed by MANOVA separate ANOVAs were performed for each of the TSM measures. The list of significant main effects and interactions of these ANOVAs is displayed in Table 15.

Table 14. *Mean Scores and Standard Deviations of Seriousness, Planning Ahead, Felt Arousal, Preferred Arousal, and The Total Telic State Measure (TSM) for Mothers and Daughters Before and After each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
TSM Subscales and Total		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Seriousness	-Before	3.64	1.19	3.48	0.91	3.77	1.07	3.59	0.91	3.45	1.16	3.42	1.10
	-After	3.32	1.15	3.49	1.13	3.86	1.37	4.09	1.23	3.03	1.17	2.96	1.11
Planning Ahead	-Before	3.50	1.20	3.30	1.22	3.72	1.09	3.57	1.07	3.46	1.38	3.43	1.18
	-After	3.30	1.18	3.41	1.23	3.83	1.21	3.56	1.31	2.99	1.22	3.38	1.27
Felt Arousal	-Before	3.66	1.04	3.59	0.80	3.90	1.00	3.53	0.97	3.74	1.00	3.51	1.05
	-After	3.80	1.12	3.72	0.94	4.15	1.06	3.63	1.24	3.91	0.91	3.92	1.01
Preferred Arousal	-Before	3.71	1.15	3.70	1.04	3.60	1.16	3.77	1.05	3.55	1.08	3.63	1.10
	-After	3.67	1.10	3.53	1.17	3.60	1.06	3.48	1.18	3.99	1.05	3.91	1.01
Total TSM	-Before	10.43	2.70	10.10	2.30	10.86	2.53	10.22	2.01	10.35	2.97	10.22	2.22
	-After	9.94	2.57	10.32	2.81	11.08	2.84	11.18	2.48	9.12	2.65	9.30	2.35

Note. N = 63 dyads

Table 15. *Signficant Main Effects and Interactions for the ANOVAs on Seriousness, Planning Ahead, Felt Arousal, Preferred Arousal and The Total TSM*

The TSM Subscales	Significant Main Effects and Interactions	*F*	df	*p*
Seriousness	Topic	17.71	1.96, 121.76	< .001
	Time x Topic	9.78	1.97, 122.26	< .001
Planning Ahead	Topic	7.44	1.95, 121.05	.001
Felt Arousal	Mother/Daughter	7.12	1, 62	.010
	Time	12.27	1, 62	.001
	Mother/Daughter x Topic	3.63	1.97, 122.25	.030
Preferred Arousal	Time x Topic	7.00	1.62, 100.20	.003
The Total TSM	Topic	12.95	1.95, 120.57	< .001
	Mother/Daughter x Time	6.61	1, 62	.013
	Time x Topic	12.35	1.97, 122.21	< .001

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 63 dyads.

For seriousness, a main effect occurred for topic but not for mother/daughter or time. A significant time x topic interaction was found and means are graphed in Figure 3. t-tests revealed that seriousness was significantly greater for the conflictual conversation (M = 3.83, SD = 0.79) than the neutral (M = 3.48, SD = 0.73), t (62) = -3.41, p = .001, or pleasant conversation (M = 3.22, SD = 0.75), t (62) = 5.59, $p < .001$. Furthermore, seriousness was greater for the neutral conversation than the pleasant conversation, t (62) = 2.70, p = .009. To explore the nature of time x topic interaction, t-tests were performed and indicated that seriousness did not differ significantly before and after the neutral conversation. However, seriousness increased significantly from before to after the conflictual conversation (M_{post} = 3.98, SD = 1.11; M_{pre} = 3.68, SD = 0.72), t (62) = -2.3, p = .025. Also, seriousness decreased significantly from before to after the pleasant conversation (M_{pre} = 3.44, SD = 0.75; M_{post} = 3.00, SD = 1.02), t (62) = -2.3, p = .025. Moreover, the t-tests showed that preconversation seriousness was significantly greater for the conflictual conversation than the pleasant conversation, t (62) = 2.96, p = .004 with no significant difference between pleasant and neutral. Postconversation seriousness was significantly higher for the conflictual conversation (M = 3.98, SD = 1.11) than the neutral (M = 3.40, SD = 0.92), t (62) = -3.71, $p < .001$, or pleasant conversation (M = 3.00, SD = 1.02), t (62) = 5.43, $p < .001$, and postconversation seriousness was significantly greater for the neutral conversation than the pleasant conversation, t (62) = 2.72, $p < .001$.

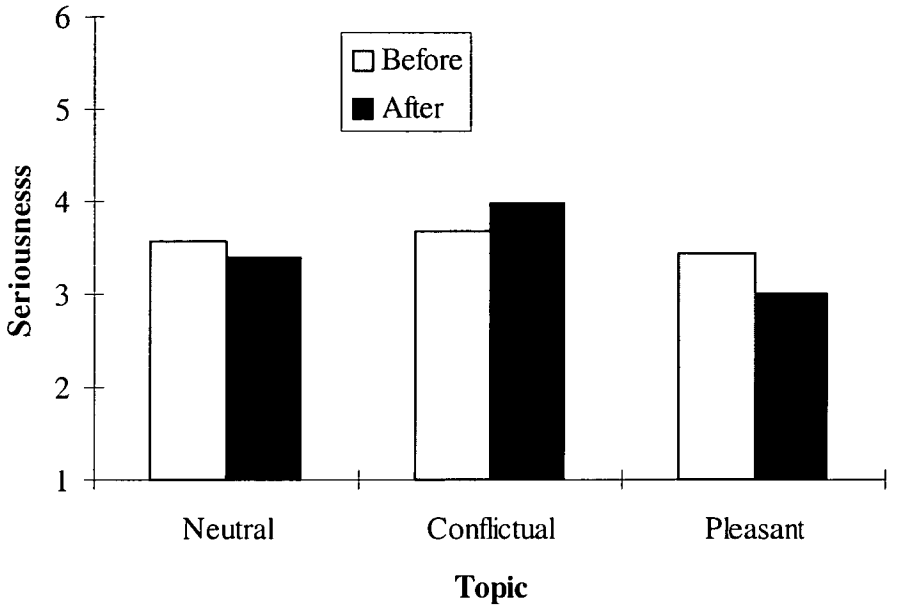

Figure 3. Mean Scores for Seriousness Before and After each Conversation Topic.

The ANOVA for planning ahead yielded a main effect for topic but not for time or mother/daughter. There were no significant interactions. t-tests showed that planning ahead was significantly greater for the conflictual conversation (M =3.67, SD = 0.72) than for the neutral (M =3.38, SD = 0.89), $t(62)$ = -0.29, p = .005, or pleasant conversation (M = 3.31, SD =0.85), t (62) = -0.35, p = .001; with no significant difference between the pleasant and neutral.

For felt arousal, ANOVA revealed a main effect for mother/daughter and time, but not for topic. A significant mother/daughter x topic interaction was found and means are graphed in Figure 4. The level of felt arousal was significantly higher for mothers (M = 3.86, SD =0.67) than for daughters (M =3.65, SD = 0.61). Felt arousal increased significantly from before to after the conversations (M_{pre} = 3.65, SD =0.60; M_{post} = 3.86, SD = 0.61). To explore the nature of mother/daughter x topic interaction, t-tests were performed and showed that for the neutral or pleasant

conversation, felt arousal was not significantly different for mothers and daughters. However, the level of felt arousal for the conflictual conversation was significantly greater for mothers (M = 4.02, SD = 0.83) than daughters (M = 3.58, SD = 0.93), t (62) = 3.53, p = .001. The t-tests also revealed that, for mothers, felt arousal was significantly greater for the conflictual conversation (M = 4.02, SD = 0.83), than the neutral (M = 3.43, SD = 0.61), t (62) = 4.39, p < .001, or pleasant conversation (M = 3.39, SD = 0.45), t (62) = 5.55, p <.001; with no significant difference between the neutral and pleasant. There was no significant differences in felt arousal of daughters across the three conversation topics.

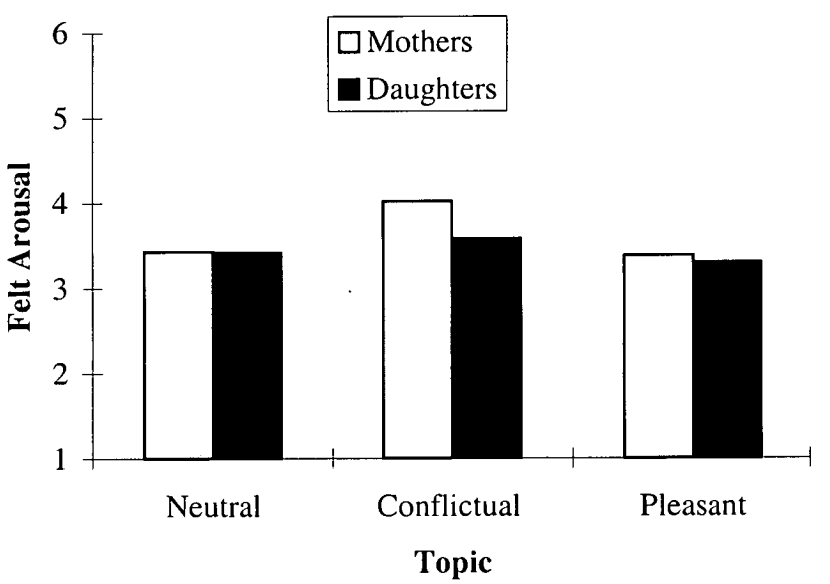

Figure 4. Mean Scores for Felt Arousal of Mothers and Daughters for each Conversation Topic.

The ANOVA for the preferred arousal yielded no main effects. A significant time x topic interaction was found and means are graphed in Figure 5. To investigate the nature of the interaction, t-tests were used and indicated that preferred arousal did not differ significantly from before to after the neutral or conflictual conversation.

However, the preferred level of arousal increased significantly from before to after the pleasant conversation (M_{pre} = 3.59, SD = 0.83; M_{post} = 3.95, SD = 0.87), t (62) = -0.36, p = .002. The t-tests also showed that preconversation preferred arousal did not differ significantly across the three conversation topics; however, postconversation preferred arousal was significantly greater for the pleasant conversation (M = 3.95, SD = 0.87) than the neutral (M = 3.60, SD = 0.95), t (62) = 2.73, p = .008 or conflictual conversation (M = 3.54, SD =0.87), t (62) = 3.43, p =.001; with no significant difference between neutral and conflictual.

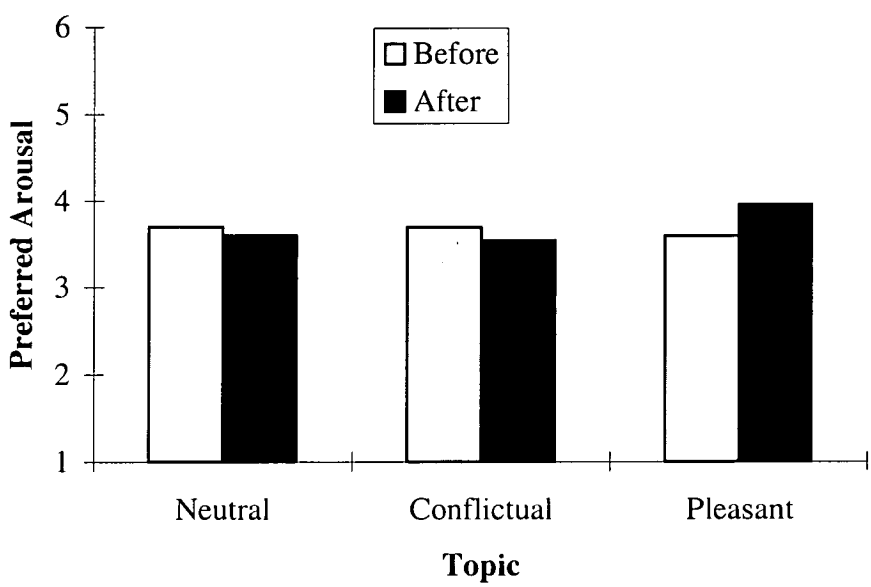

Figure 5. Mean Scores for Preferred Arousal Before and After each Conversation Topic.

For the total telic state score, a main effect occurred for topic, but not for mother/daughter or time. There were significant interactions for mother/daughter x time and time x topic and means are graphed in Figure 6 and Figure 7 respectively. t-tests revealed that the total telic state score was significantly greater for the

conflictual conversation (M =10.84, SD = 1.65) than the neutral (M = 10.20, SD =1.83), t (62) = -2.93, p = .005, or pleasant conversation (M = 9.74, SD = 1.79), t (62) = 4.76, $p < .001$. The total telic state score was significantly greater for the neutral conversation than the pleasant conversation, t (62) = 2.29, p = .025. To interpret the mother/daughter x time interaction, t-tests were performed and revealed that for daughters, the total telic state score did not differ significantly from before to after the conversations. However, the total telic state score of mothers decreased significantly from before to after the conversations (M_{pre} =10.55, SD = 2.22; M_{post} = 10.05, SD = 1.87), t (62) = 2.59, p = .012 but there was no significant difference in preconversation total telic score between mothers and daughters; nor was there a significant difference in postconversation total telic score between mothers and daughters. For the time x topic interaction, t-tests indicated that the total telic state score did not differ significantly before and after the neutral conversation but increased significantly from before to after the conflictual conversation (M_{post} = 11.13, SD = 2.12; M_{pre} = 10.54, SD = 1.65), t (62) = -2.47, p = .016 and decreased significantly from before to after the pleasant conversation (M_{pre} = 10.28, SD = 2.03; M_{post} = 9.21, SD = 2.08), t (62) = 4.24, $p < .001$. Furthermore, there were no significant differences in preconversation total telic score across the three conversation topics. However, postconversation total telic score was significantly greater for the conflictual conversation (M =11.13, SD = 2.12) than the neutral (M = 10.13, SD = 2.22), t (62) = -3.17, p =.002, or pleasant conversation (M = 9.21, SD = 2.08), t (62) = -5.7, $p < .001$, and, postconversation total telic state score was significantly greater for the neutral conversation than the pleasant conversation, t (62) = -3.05, p = .003.

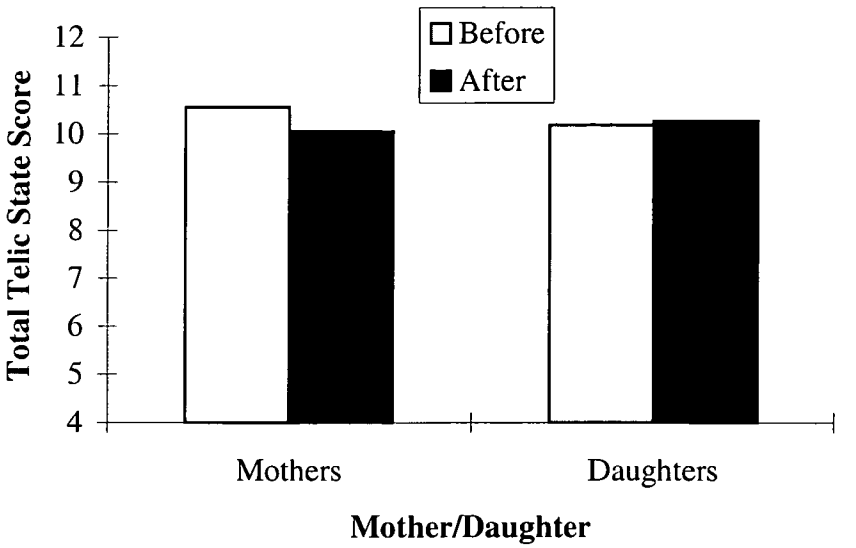

Figure 6. Mean Scores for Total Telic State Score of Mothers and Daughters Before and After Conversations.

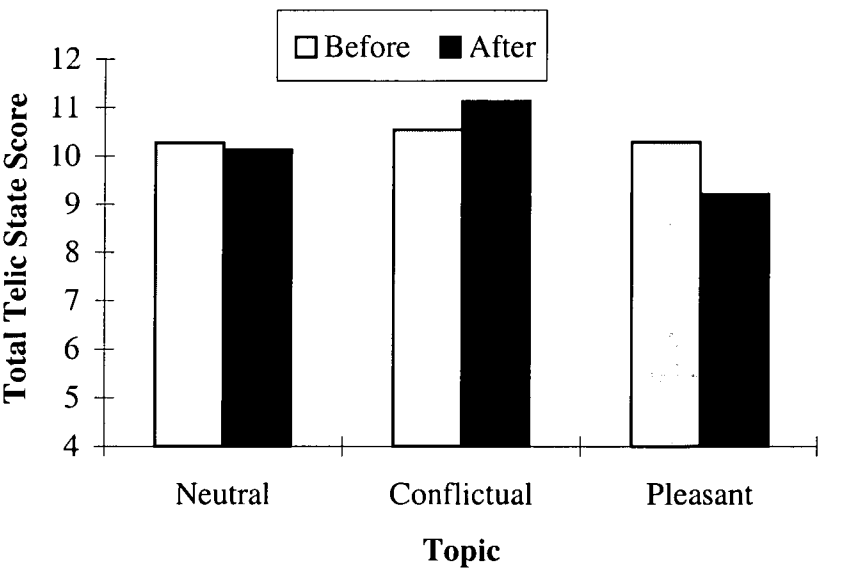

Figure 7. Mean Scores for Total Telic State Score Before and After each Conversation Topic.

Summary. The ANOVAs on all subscales of the TSM confirmed the hypothesis (1.5) regarding the lack of impact of the neutral conversation on the levels of felt arousal and the telic state. This part of data analyses provided only partial support for the predictions (1.6 and 1.7) that the level of telic state would increase and decrease during the conflictual and pleasant conversations respectively. The

findings of ANOVAs on seriousness and the total telic score supported the predictions regarding the impacts of the conflictual conversation and the pleasant conversations on respective increase and decrease in the level of telic state for the participants. For the preferred arousal, this effect was limited to the pleasant conversation. However, the conflictual conversation did not affect the level of felt arousal. The results of all subscales supported the hypothesis (1.8) that the conflictual conversation would induce the highest level of felt arousal and the telic state for mothers and daughters. However, for felt arousal, the differences were only observed for mothers. The data also confirmed the prediction (1.9) that the highest level of paratelic state would be reported during the pleasant conversation. The findings did not support the hypothesis regarding mother-daughter difference in the telic state (1.4). However, during the conflictual conversation, felt arousal was greater for mothers than daughters. Also, the total telic score of mothers increased after the conversations.

Measures of Tension/Effort-Stress, Pleasant/Unpleasant Somatic and Transactional Emotions

Tension/effort- stress from body and external factors. In addition to data regarding VAS rating of stress, this part of data analyses also tested the hypotheses (1.5, 1.6 and 1.7) that the level of stress would remain unchanged, increase and decrease during the neutral, conflictual and pleasant conversations respectively, and that the highest level of stress would be reported during the conflictual conversation (1.8). However, this subsection of data examined these hypotheses for different ratings of TESI tension/effort stress caused by body and external factors. Mean

scores and standard deviations of stress for external factors, body stress, effort for stress from the external factors and effort for body stress are presented in Table 16.

For tension/effort-stress ratings, MANOVA showed a significant effect for topic, Pillai's Trace = .101, F (2, 61) = 3.42, p = .039. There was a significant interaction for time x topic, Pillai's Trace = .161, F (2, 61) = 6.76, p = .002. To locate significant effects revealed by MANOVA, separate ANOVAs were conducted for each of the ratings. The list of significant main effects and interaction of these ANOVAs is presented in Table 17.

The ANOVA on external tension stress yielded no main effects. A significant time x topic interaction was found. To interpret the interaction, t-tests were used and showed that external tension stress did not differ significantly before and after the conflictual or pleasant conversation; however, external tension stress decreased significantly from before to after the neutral conversation (M_{pre} = 2.46, SD = 1.15; M_{post} = 2.13, SD = 1.04), t (62) = 2.66, p = .010. There were no significant differences in preconversation stress from external factors across the three conversation topics; nor were there significantly postconversation differences in stress between the neutral and pleasant or neutral and conflictual; but postconversation stress was significantly greater for the conflictual conversation (M = 2.43, SD = 1.16) than the pleasant conversation (M = 2.09, SD = 1.04), t (62) = 2.11, p = .039.

Table 16. *Mean Scores and Standard Deviations of TESI Tension and Effort Stress due to Body and External Factors For Mothers and Daughters Before and After each Conversation Topic (N = 63 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
TESI Tension and Effort Stress		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Tension Stress: External Factors	-Before	2.41	1.49	2.51	1.38	2.24	1.33	2.35	1.37	2.29	1.30	2.17	1.39
	-After	2.29	1.43	1.98	1.13	2.43	1.52	2.43	1.41	2.13	1.35	2.05	1.38
Tension Stress: Own Body	-Before	2.43	1.35	2.38	1.44	2.44	1.28	2.48	1.57	2.51	1.38	2.30	1.57
	-After	2.27	1.41	2.14	1.47	2.71	1.43	2.56	1.62	2.33	1.40	2.24	1.50
Effort Stress: External Factors	-Before	2.38	1.54	2.59	1.63	2.32	1.23	2.27	1.36	2.41	1.41	2.29	1.62
	-After	2.22	1.36	1.98	1.13	2.71	1.71	2.54	1.58	2.29	1.44	2.06	1.48
Effort Stress: Own Body	-Before	2.33	1.38	2.38	1.60	2.70	1.42	2.33	1.50	2.54	1.38	2.43	1.69
	-After	2.19	1.26	1.98	1.30	2.79	1.53	2.56	1.65	2.40	1.45	2.13	1.52

Table 17. *Signficant Main Effects and Interactions for the ANOVAs on Tension/Effort Stress from Body and External Factors (N = 63 dyads)*

Tension/Effort Stress	Significant Main Effects and Interactions	*F*	df	*p*
Tension Stress :External Factors	Time x Topic	3.82	1.90, 117.92	.027
Tension Stress : Own Body	Time x Topic	3.37	1.92, 119.00	.040
Effort Stress : External Factors	Time x Topic	9.84	1.85, 114.70	< .001
Effort Stress : Own Body	Topic	6.23	1.71, 105.77	.004
	Time x Topic	4.81	1.90, 117.89	.011

Note. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures.

The ANOVA for body tension stress yielded no main effect for mother/daughter, time or topic. A significant time x topic interaction was found and t-tests revealed that body tension stress did not differ significantly from before to after any of the topics. Nor did the preconversation body tension stress differ significantly across the three conversation topics. However, the time x topic interaction was due to postconversation body tension stress being significantly greater for the conflictual conversation ($M = 2.63$, $SD = 1.21$), than the neutral ($M = 2.21$, $SD = 1.10$), t (62) = -2.79, $p = .007$, or pleasant conversation ($M = 2.29 = 1.1$, SD = 1.10), t (62) = 2.50, $p = .015$; with no difference between the neutral and pleasant.

The ANOVA on external effort stress did not yield any main effects. A significant time x topic interaction was found and t-tests indicated that external effort stress decreased significantly from before to after the neutral ($M_{pre} = 2.48$, $SD = 1.27$; $M_{post} = 2.10$, $SD = 1.00$), t (62) = 3.08, $p = .003$ and pleasant conversation ($M_{pre} = 2.35$, $SD = 1.16$; $M_{post} = 2.17$, $SD = 1.15$), t (62) = 2.30, $p = .025$; and increased significantly from before to after the conflictual conversation ($M_{post} = 2.63$, $SD = 1.30$; $M_{pre} = 2.29$, $SD = 0.94$), t (62) = -2.32, $p = .024$. There were no significant differences in preconversation external effort stress across the three conversation topics; nor were there significantly postconversation differences in external effort stress between the neutral or pleasant conversation; but postconversation effort for external factors was significantly greater for the conflictual conversation than the neutral, t (62) = -3.40, $p = .001$, or pleasant conversation, t (62) = 3.09, $p = .003$.

The ANOVA for body effort stress yielded a main effect for topic and a significant time x topic interaction. The topic main effect was because body effort stress was significantly greater for the conflictual conversation ($M = 2.60$, $SD = 1.07$)

than the neutral conversation (M = 2.22, SD = 1.00), t (62) = -3.67, p = .001. However, there were no significant differences in body effort stress for the pleasant conversation and the conflictual or neutral conversation. For the time x topic interaction, t-tests revealed that body effort stress did not differ significantly before and after the conflictual conversation. However, body effort stress decreased significantly from before to after the neutral (M_{pre} = 2.36, SD = 1.09; M_{post} = 2.09, SD = 0.97), t (62) = 2.80, p = .007 or pleasant conversation (M_{pre} = 2.48, SD = 1.09; M_{post} = 2.26, SD = 1.13), t (62) = 2.17, p = .034. Moreover, t-tests revealed that postconversation body effort stress was significantly greater for the conflictual conversation (M = 2.67, SD = 1.26) than the pleasant (M = 2.26, SD = 1.13), t (62) = 2.56, p = .013, or neutral conversation (M = 2.09, SD = 0.97), t (62) = -4.48, $p <$ .001; but preconversation body effort stress was not significantly different across the three conversation topics.

Summary. The ANOVAs on the four ratings of tension/effort stress for body and external factors supported the hypothesis (1.8) that the level of stress would be greater for the conflictual conversation than for the neutral or pleasant conversation. However, the predictions (1.5, 1.6 and 1.7) regarding the impact of each conversation on the level of stress was only partially supported by the data: the effect of the conflictual conversation on increasing the level of stress from before to after the conversation was limited to body effort stress. Furthermore, the neutral and pleasant conversations reduced the level of body effort stress from before to after the conversations. The level of external tension stress decreased from before to after the neutral conversation. The effects of the neutral conversation on reducing the levels

of body tension stress and external tension stress were opposite to the hypothesis (1.5) that the level of stress would remain unchanged during the neutral conversation.

Pleasant somatic emotions. This subsection of the data analyses tested the hypotheses (1.5, 1.6 and 1.7) that the levels of pleasant somatic emotions will remain unchanged, decrease and increase during the neutral, conflictual and pleasant conversations respectively, and that the highest levels of pleasant somatic emotions would be reported during the pleasant conversation (1.9). Table 18 presents mean scores and standard deviations of relaxation, excitement, placidity and provocativeness for mothers and daughters before and after each conversation topic.

For the MANOVA on pleasant somatic emotions (PSE) (4 (PSE) x 3 x 2 x 2), significant effects were found for PSE, Pillai's Trace = .830, F (3, 60) = 97.93, $p <$ .001 and topic, Pillai's trace = .131, F (2, 61) = 4.61, p = .014, p = 0.014. There were significant interactions for PSE x Time, Pillai's Trace = .213, F (3, 60) = 5.41, p = .002, PSE x Topic, Pillai's Trace = .442, F (6, 57) = 7.53, $p <$ .001, time x topic, Pillai's Trace, F (2, 61) = .223, $p <$ .001, PSE x time x topic, Pillai's Trace = .463, F (6, 57) = 8.20, $p <$ .001, and PSE x mother/daughter x time x topic, Pillai's Trace = .208, F (6, 57) = 2.50, p = .033. To locate the significant effects showed by MANOVA, separate ANOVAs were performed for each of the pleasant somatic emotions. The list of significant main effects and interactions of these ANOVAs is displayed in Table 19.

Table 18. *Mean Scores and Standard Deviations for Pleasant Somatic TESI Emotions (Relaxation, Excitement, Placidity, and Provocativenss) for Mothers Daughters Before and After each Conversation Topic (N = 63 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Pleasant Somatic TESI Emotions		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Relaxation-	Before	4.94	1.49	4.79	1.61	4.78	1.63	4.75	1.53	5.05	1.60	4.76	1.75
	After	5.02	1.43	5.11	1.51	4.60	1.86	3.98	1.93	5.46	1.08	5.24	1.76
Excitement-	Before	3.02	1.40	3.21	1.52	3.03	1.32	3.19	1.46	2.90	1.38	3.02	1.50
	After	2.86	1.42	2.98	1.48	3.03	1.31	2.83	1.57	3.30	1.40	3.46	1.75
Placidity-	Before	3.41	1.77	3.86	1.79	3.25	1.90	3.22	1.92	3.62	1.88	2.89	1.77
	After	3.56	1.92	3.06	1.74	3.10	1.68	2.92	1.76	3.49	1.74	3.08	1.90
Provocativeness-	Before	1.38	0.79	1.73	1.35	1.52	0.90	1.62	1.25	1.33	0.74	1.62	1.21
	After	1.41	0.87	1.73	1.31	1.89	1.14	2.14	1.53	1.38	0.83	1.70	1.46

Table 19. *Signficant Main Effects and Interactions for the ANOVAs on Relaxation, Excitement, Placidity and Provocativeness*

Pleasant Somatic TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Relaxation	Topic	14.84	1.71, 105.77	.004
	Time x Topic	11.21	1.85, 114.57	.001
Excitement	Time x Topic	8.70	1.90, 118.02	< .001
Placidity	Time	5.41	1, 62	.023
	Topic	4.43	1.96, 121.31	.014
	Mother/Daughter x Topic	3.68	1.82, 113.02	.032
Provocativeness	Time	11.14	1, 62	.001
	Topic	9.63	1.95, 121.18	< .001
	Time x Topic	7.88	2.00, 123.89	.001

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 63 dyads.

For relaxation, the ANOVA showed a main effect for topic but not for time or mother/daughter. A significant time x topic interaction was found. Relaxation was significantly lower for the conflictual conversation (M = 4.53, SD = 1.21) than the neutral (M = 4.96, SD = 1.09), $t(62) = 3.61$, $p = .001$ or pleasant conversation (M = 5.13, SD = 1.10), t (62) = -5.14, $p < .001$. There was no significant difference between relaxation for the neutral and pleasant conversation. To interpret the time x topic interaction, t-tests showed that relaxation decreased significantly from before to after the conflictual conversation (M_{pre} = 4.76, SD = 1.28; M_{post} = 4.29, SD = 1.38), t (62) = 3.49, $p = .001$, and increased significantly from before to after the pleasant conversation (M_{post} = 5.35, SD = 1.14; M_{pre} = 4.90, SD = 1.34), t (62) = -3.03, p = .004; however, relaxation did not differ significantly from before to after the neutral conversation. The t-tests indicated that there were no significant differences in preconversation relaxation across the three conversation topics; however, postconversation relaxation was significantly greater for the pleasant conversation than for the neutral (M = 5.06, SD = 1.20), t (62) = -2.00, $p = .049$, or conflictual conversation, t (62) = -7.28, p = -7.28, $p < .001$; also postconversation relaxation was significantly greater for the neutral conversation than the conflictual conversation, t (62) = 5.01, $p < .001$.

The ANOVA on excitement did not yield any main effects. A significant time x topic interaction was found, and t-tests showed that excitement increased significantly from before to after the pleasant conversation (M_{post} = 3.38, SD = 1.28; M_{pre} = 2.96, SD = 1.12), t (62) = -3.48, $p = .001$; however, excitement did not differ significantly before and after the neutral or conflictual conversation. The t-tests also revealed that postconversation excitement was significantly greater for the pleasant conversation than the neutral (M = 2.92, SD = 1.13), t (62) = -3.05, p =.003, or

conflictual conversation (M = 2.93, SD = 1.04), t (62) = -2.90, p = .005. However, there were no significant differences in preconversation excitement across the three conversation topics.

For placidity, the ANOVA yielded a main effect for time and for topic but not for mother/daughter. A significant mother/daughter x topic interaction was found and means are graphed in Figure 8. Placidity decreased significantly from before to after the conversations (M_{pre} = 3.38, SD = 1.27; M_{post} = 3.20, SD = 1.26). t-tests revealed that placidity was significantly higher for the neutral conversation (M = 3.47, SD = 1.31) than the conflictual conversation (M = 3.12, SD = 1.38), t (62) = 2.80, p = .007; however, there were no significant differences in placidity between the pleasant conversation and the neutral or conflictual conversation. For the mother/daughter x topic interaction, the t-tests indicated that placidity for the pleasant conversation was significantly greater for mothers (M = 3.56, SD = 1.61) than daughters (M = 2.98, SD = 1.74), t (62) = 2.25, p = .028; but, there was no significant difference in placidity between mothers and daughters during the neutral and conflictual conversations. Also, placidity for mothers was significantly greater for the pleasant conversation (M = 3.56, SD = 1.61) than the conflictual conversation (M = 3.17, SD = 1.56), t (62) = -2.47, p = .016. However, placidity for mothers did not differ significantly for the neutral and conflictual or pleasant conversation. For daughters, placidity was significantly greater for the neutral conversation (M = 3.46, SD = 1.52) than the conflictual (M = 3.07, SD = 1.75), t (62) = 2.16, p = .035 or pleasant conversation (M = 2.98, SD = 1.74), t (62) = 3.00, p = .004; with no significant difference between the conflictual and pleasant topics.

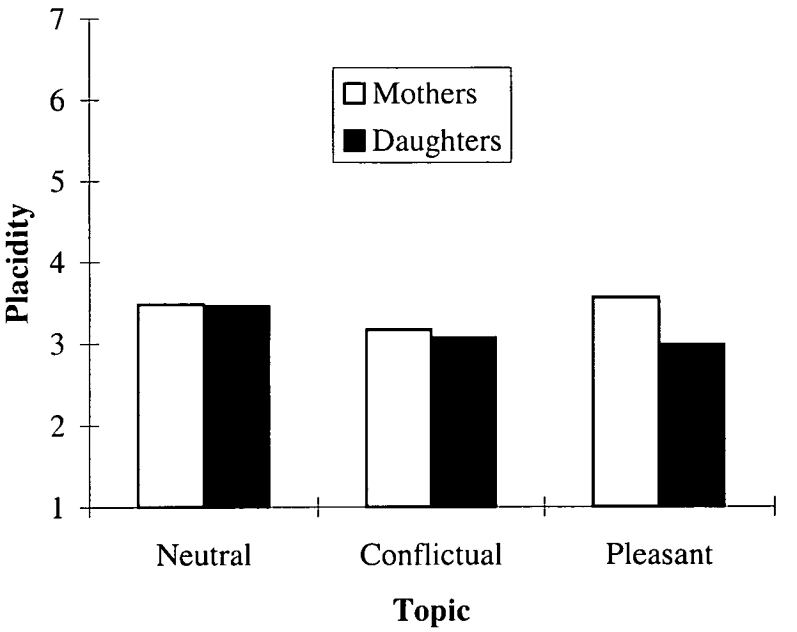

Figure 8. Mean Scores of Placidity for Mothers and Daughter for each Conversation Topic.

The ANOVA on provocativeness yielded a main effect for time and for topic, but not for mother/ daughter. A significant time x topic interaction was found. Provocativeness increased significantly from before to after the conversations (M_{post} = 1.71, SD = 0.84; M_{pre} = 1.53, SD = 0.68). t-tests revealed that there was no significant difference in provocativeness between the neutral and pleasant conversation. However, provocativeness was significantly greater for the conflictual conversation (M = 1.79, SD = 0.88) than the neutral (M = 1.56, SD = 0.78), t (62) = -3.62, p = .001, or pleasant conversation (M = 1.51, SD = 0.74), t (62) = 4.02, $p <$ .001. To interpret the time x topic interaction, t-tests showed that provocativeness increased significantly from before to after the conflictual conversation (M_{post} = 2.02, SD = 1.07; M_{pre} = 1.57, SD = 0.84), t (62) = -4.56, $p <$ .001; however, provocativeness did not differ significantly from before to after the neutral or pleasant conversation. There were no significant differences in preconversation

provocativeness across the three conversation topics; however, postconversation provocativeness was significantly greater for the conflictual conversation ($M = 2.02$, $SD = 1.07$) than the neutral ($M = 1.57$, $SD = 0.89$), $t\ (62) = -4.66, p < .001$, or pleasant conversation ($M = 1.54$, $SD = 0.85$), $t\ (62) = 4.95, p < .001$; with no significant difference between neutral and pleasant topics.

Summary. This portion of the findings provided partial support for the hypotheses (1.5, 1.6 and 1.7) that the levels of pleasant somatic emotions would remained unchanged, decrease and increase during the neutral, conflictual and pleasant conversations respectively. The lack of changes in pleasant somatic emotions during the neutral conversation, the impact of the pleasant conversation on enhancing the levels of relaxation and excitement and the effect of the conflictual conversation in reducing the level of relaxation were in predicted directions. However, the effect of the conflictual conversation on increasing the level of provocativeness contradicted the hypothesis. The data provided partial support for the hypothesis (1.9) that the levels of pleasant somatic emotions would be greater during the pleasant conversation than the other two conversations. The salience of the pleasant conversation in generating the highest levels of relaxation and excitement was in line with this prediction. The finding that the highest level of provocativeness was reported during the conflictual conversation contradicted the hypothesis. The ANOVAs provided additional information in that the neutral and pleasant conversation produced the highest level of placidity for daughters and mothers respectively. Also, the overall impact of all conversations included increases in the levels of excitement, provocativeness and reduction in the levels of placidity for the participants.

Unpleasant somatic emotions. This subsection of the data analyses examined the hypotheses (1.5, 1.6 and 1.7) that the levels of unpleasant somatic emotions would remain unchanged, increase and decrease during the neutral, conflictual and pleasant conversations respectively, and that the levels of unpleasant somatic emotion would be greater during the conflictual conversation than the other two conversations (1.8). Mean scores and standard deviations of anxiety, boredom, anger and sullenness for mothers and daughters are presented in Table 20.

For the unpleasant somatic emotions (USE), the MANOVA (4 x 3 x 2 x 2) showed significant effects for USE, Pillai's Trace = .648, F (3, 60) = 36.88, $p < .001$ mother/daughter, Pillai's Trace = .192, F (1, 62) = 14.77, $p < .001$, and topic, Pillai's Trace = .293, F (2, 61) = 12.67, $p < .001$. There were significant interactions for USE x mother/daughter, Pillai's Trace = .186, F (3, 60) = 4.56, $p = .006$, USE x time, Pillai's Trace = .272, F (3, 60) = 7.46, $p < .001$, USE x topic, Pillai's Trace = .291, F (6, 57) =3.90, $p = .002$, mother/daughter x topic, Pillai's Trace = .100, F (2, 61) = 3.39, $p = .040$, time x topic, Pillai's Trace = .162, F (2, 61) = 5.90, $p = .005$, and USE x time x topic, Pillai's Trace = .270, F (6, 57) = 3.52, $p = .005$. Unpleasant somatic emotions were greater for daughters than mothers (M = 1.91, SD = 0.75; M = 1.58, SD = 0.60). To locate significant effects revealed by MANOVA, separate ANOVAs were conducted on each of the unpleasant somatic emotions. The list of significant main effects and interactions of these ANOVAs is presented in Table 21.

Table 20. *Mean Scores and Standard Deviations of Unpleasant Somatic (TESI) Emotions (Anxiety, Boredom, Anger, and Sullenenss) for Mothers and Daughters Before and After each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Unpleasant Somatic TESI Emotions		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Anxiety	-Before	2.06	1.42	2.21	1.33	2.41	1.49	2.44	1.55	2.16	1.48	2.35	1.52
	-After	1.95	1.20	2.16	1.48	2.33	1.43	2.67	1.45	1.84	1.19	1.84	1.15
Boredom	-Before	1.59	1.09	2.46	1.66	1.62	1.22	2.27	1.54	1.71	1.28	2.17	1.36
	-After	1.51	0.90	2.38	1.72	1.62	1.18	2.21	1.47	1.51	0.90	1.86	1.19
Anger	-Before	1.21	0.85	1.37	0.84	1.29	0.83	1.41	0.94	1.21	0.77	1.40	0.89
	-After	1.30	0.84	1.35	0.90	1.71	1.17	2.16	1.61	1.19	0.72	1.30	0.82
Sullenenss	-Before	1.25	0.84	1.87	1.66	1.14	0.47	1.52	1.08	1.22	0.77	1.46	1.01
	-After	1.14	0.50	1.59	1.20	1.24	0.62	1.83	1.25	1.25	0.72	1.59	1.19

Note. N = 63 dyads.

Table 21. *Signficant Main Effects and Interactions for the ANOVA on Anxiety, Boredom, Anger and Sullrnness for Mothers and Daughters*

Unpleasant Somatic TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Anxiety	Time	11.14	1, 62	.001
	Topic	8.80	1.80, 111.85	< .001
	Time x Topic	4.46	1.93, 119.75	.015
Boredom	Mother/Daughter	17.68	1, 62	< .001
	Time	5.18	1, 62	.026
	Mother/Daughter x Topic	3.47	2.00, 123.76	.034
Anger	Time	11.00	1, 62	.002
	Topic	16.60	1.62, 100.57	< .001
	Time x Topic	11.56	1.44, 89.46	< .001
Sullenness	Mother/Daughter	19.86	1, 62	< .001
	Time x Topic	3.38	1.99, 123.47	.037

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 63 dyads.

The ANOVA for anxiety yielded main effects for time and for topic but not for mother/daughter. A significant time x topic interaction was found. The time effect was due to a significant decrease in anxiety from before to after the conversations (M_{pre} = 2.27, SD = 0.93; M_{post} = 2.13, SD = 0.87). For topic, t-tests indicated that there was no significant difference in anxiety between the neutral and pleasant conversation. However, anxiety was significantly greater for the conflictual conversation (M = 2.46, SD = 1.02) than the neutral (M = 2.10, SD = 0.98), t (62) = -3.16, p = .002, or pleasant conversation (M = 2.05, SD = 0.98), t (62) = 3.54, p = .001. To interpret time x topic interaction, t-tests were performed and showed that anxiety did not differ significantly before and after the neutral or conflictual conversation. However, anxiety decreased significantly from before to after the pleasant conversation (M_{pre} = 2.54, SD = 1.15; M_{post} = 1.84, SD = 0.97), t (62) = 3.99, $p < .001$. Also, while there were no significantly differences in preconversation anxiety across the three conversation topics, postconversation anxiety was significantly greater for the conflictual conversation (M = 2.5, SD = 1.16) than the neutral (M = 2.06, SD = 1.09), t (62) = -3.10, p = .003, or pleasant conversation (M = 1.84, SD = 0.97), t (62)= 4.42, $p < .001$; with no significant difference between neutral and pleasant topics.

For boredom, the ANOVA yielded a main effect for mother/daughter and for time but not for topic. A significant mother/daughter x topic interaction was found and means are graphed in Figure 9. The mother/daughter effect was due to boredom being significantly greater for daughters (M = 2.22, SD = 1.16) than mothers (M = 1.59, SD = 0.84). For time, boredom decreased significantly from before to after the conversations (M_{pre} = 1.97, SD = 0.86; M_{post} = 1.85, SD = 0.83). To explore the nature of mother/daughter x topic interaction, t-tests were used and revealed that

daughters experienced a greater level of boredom than did mothers for the neutral (M = 2.42, SD = 1.51, M = 1.55, SD = 0.94), t (62) = -4.43, $p < .001$, conflictual (M = 2.24, SD = 1.36, M = 1.62, SD = 1.01), t (62) = -3.23, p = .002, and pleasant conversation (M = 2.02, SD = 1.15, M = 1.61, SD = 0.98), t (62) = -2.62, p = .011. Furthermore, for daughters, boredom was significantly greater for the neutral conversation than the pleasant conversation, t (62) = 2.52, p = .014, with no significant difference between neutral and conflictual or conflictual and pleasant conversations. For mothers, boredom did not significantly differ across the three conversation topics.

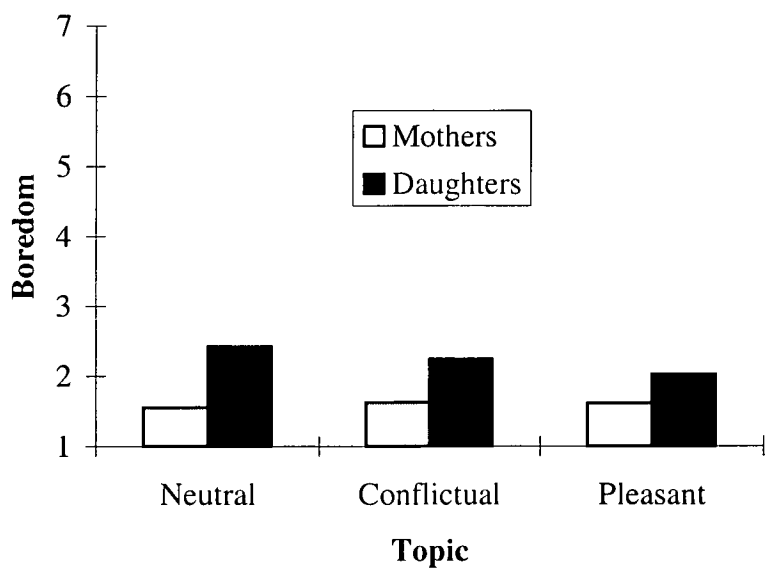

Figure 9. Mean Scores of Boredom for Mothers and Daughters for each Conversation Topic.

The ANOVA for anger yielded a main effect for time and for topic but not for mother/daughter. A significant time x topic interaction was found. Anger increased significantly from before to after the conversations (M_{post} = 1.50, SD = 0.68; M_{pre} = 1.31, SD = 0.55). t-tests revealed that anger was significantly greater for the

conflictual conversation (M = 1.64, SD = 0.79) than the neutral (M = 1.31, SD = 0.64), t (62) = -3.99, $p < .001$ or pleasant conversation (M = 1.27, SD = 0.84), t (62) = 5.19, $p < .001$; but there was no significant difference in anger between the neutral and pleasant conversation. For the time x topic interaction, t-tests revealed that anger increased significantly from before to after the conflictual conversation (M_{post} = 1.94, SD = 1.18; M_{pre} = 1.35, SD = 0.68), t (62) = -4.26, $p < .001$; however, anger did not differ significantly from before to after the neutral or pleasant conversation. Furthermore, while there were no significant differences in preconversation anger across the three conversation topics; postconversation anger was significantly greater for the conflictual conversation (M = 1.94, SD = 1.18) than the neutral (M = 1.33, SD = 0.79), t (62) = -4.17, $p < .001$, or pleasant conversation (M = 1.25, SD = 0.59), t (62) = 5.00, $p < .001$; but there were no significant differences in postconversation anger between the neutral and pleasant conversations.

The ANOVA on sullenness yielded a main effect for mother/daughter but not for time and for topic. A significant time x topic interaction was found. Sullenness was significantly greater for daughters (M = 1.64, SD = 0.89) than mothers (M = 1.24, SD = 0.61). To explore the cause of the time x topic interaction, t-tests were used and showed that sullenness increased significantly from before to after the conflictual conversation (M_{post} = 1.53, SD = 0.76; M_{pre} = 1.33, SD = 0.68), t (62) = -2.13, p = .037; but sullenness did not differ significantly from before and after the neutral or pleasant conversation. There were no significant differences in preconversation or postconversation sullenness across the three conversation topics

Summary. This portion of the results provided partial support for the hypotheses (1.5, 1.6 and 1.7) that the levels of unpleasant somatic emotions would

remain unchanged, increase and decrease during the neutral, conflictual and pleasant conversations respectively. The lack of changes in unpleasant somatic emotions during the neutral conversation, the impact of the conflictual conversation on increases in the levels of anger and sullenness, and reduction in the level of anxiety during the pleasant conversation were consistent with the hypotheses. The prediction (1.8) that the conflictual conversation would generate the highest levels of unpleasant somatic emotions was partially upheld. The prominence of the conflictual conversation in producing the highest levels of anxiety and anger was in line with the prediction. However, the impact of the neutral conversation on producing the highest levels of boredom for daughters did not support the hypothesis. The ANOVAs produced additional information in that the overall impact of all conversations was to decrease the level of anxiety for participants, and that daughters experienced greater levels of boredom and sullenness than did mothers.

Pleasant transactional emotions. This subsection of the data analyses explored the hypotheses (1.5, 1.6 and 1.7) that the levels of pleasant transactional emotions will remain unchanged, decrease and increase during the neutral, conflictual and pleasant conversations respectively, and that the highest levels of pleasant transactional emotions would be reported during the pleasant conversation (1.9). Table 22 presents mean scores and standard deviations for the pleasant transactional emotions (PTE) of pride, modesty, gratitude, and virtue for mothers and daughters before and after each conversation topic.

For the PTE, the MANOVA (4 x 3 x 2 x 2) showed a significant effect for topic, Pillai's Trace = .115, F (2, 61) = 3.97, p = .024. There was a significant interaction for mother/daughter x topic, Pillai's Trace = .112, F (2, 61) = 3.84, p =

.027. To locate the significant effects revealed by MANOVA, separate ANOVAs were conducted for each of the positive transactional emotions. The list of significant main effects and interactions of these ANOVAs is displayed in Table 23.

Table 22. *Mean Scores and Standard Deviations of Pleasant Transactional TESI Emotions (Pride, Modesty, Gratitude, and Virtue) for Mothers and Daughters Before and After each Conversation Topic (N = 63 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Pleasant Transactionanal TESI Emotions		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Pride-	Before	2.87	1.88	2.68	1.64	3.17	1.93	2.62	1.56	3.17	2.05	2.78	1.63
	After	2.97	1.75	2.62	1.61	3.22	1.92	2.52	1.65	3.51	2.07	2.65	1.88
Modesty-	Before	2.87	2.01	2.90	1.64	2.94	1.75	2.87	1.62	3.19	1.77	2.76	1.78
	After	2.79	1.81	2.92	1.74	3.13	1.94	2.78	1.63	3.35	2.11	2.92	1.78
Gratitude-	Before	2.90	1.78	3.02	1.66	3.06	1.91	3.05	1.53	3.10	1.82	3.02	1.74
	After	3.10	1.91	3.11	1.82	2.87	1.73	3.08	1.46	3.54	2.01	3.41	1.92
Virtue-	Before	2.66	1.84	2.86	1.82	2.95	1.82	2.78	1.88	2.84	1.77	2.75	1.87
	After	2.60	1.80	2.87	1.86	2.62	1.67	2.67	1.77	2.84	1.85	2.71	1.84

Table 23. *Signficant Main Effects and Interactions for the ANOVAs on Pride, Modesty, Gratitude and Virtue*

Positive Transactional TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Pride	Mother/Daughter	4.12	1, 62	.047
	Topic	3.92	1.98, 122.45	.023
	Mother/Daughter x Time	4.96	1, 62	.030
	Mother/Daughter x Topic	4.03	1.89, 117.15	.022
Modesty	Mother/Daughter x Topic	3.46	1.94, 120.31	.036
Gratitude	Time	4.39	1, 62	.040
	Topic	5.59	1.98, 122.94	.005
	Time x Topic	4.25	1.86, 115.31	.019
Virtue	Nil			

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 63 dyads.

For the ANOVA on pride, a main effect occurred for mother/daughter and for topic but not for time. There were significant interactions for mother/daughter x time and mother/daughter x topic and means are graphed in Figures 10 and 11 respectively. Pride was significantly greater for mothers (M = 3.15, SD = 1,76) than daughters (M = 2.65, SD = 1.48). There was no significant difference by t-tests for pride for the conflictual conversation and the neutral or pleasant conversation. However, pride was significantly greater for the pleasant conversation (M = 3.03, SD = 1.47) than the neutral conversation (M = 2.79, SD = 1.28), t (62) = -2.71, p = .009. For the mother/daughter x time interaction, the t-tests revealed that postconversation pride was significantly greater for mothers (M = 3.51, SD = 2.07) than daughters (M = 2.65, SD = 1.88), t (62) = 2.82, p = .006; however, there was no significant difference in preconversation pride between mothers and daughters. Also, pride of daughters was not significantly different before and after the conversations; for mothers, the difference in pride from before (M = 3.07, SD = 1.79) to after conversations (M = 3.23, SD = 1.80) failed to reach significance, t (62) = -1.95, p = .056. For the mother/daughter x topic interaction, t-tests indicated that mothers reported greater levels of pride during the conflictual (M = 3.20, SD = 1.83, M = 2.57, SD = 1.55), t (62) = 2.29, p = .025, and pleasant conversation (M = 3.34, SD = 1.96, M = 2.71, SD = 1.68), t (62) = -2.32, p = .024, than did daughters; but pride for the neutral conversation did not differ significantly for mothers and daughters. For mothers, pride was significantly lower for the neutral conversation (M = 2.92, SD = 1.73) than the conflictual (M = 3.19, SD = 1.83), t (62) = -2.43, p = .018, or pleasant conversation (M = 3.34, SD = 1.96), t (62) = -3.46, p = .001, with no significant differences between conflictual and pleasant topics. For daughters, pride did not differ significantly across the three conversation topics.

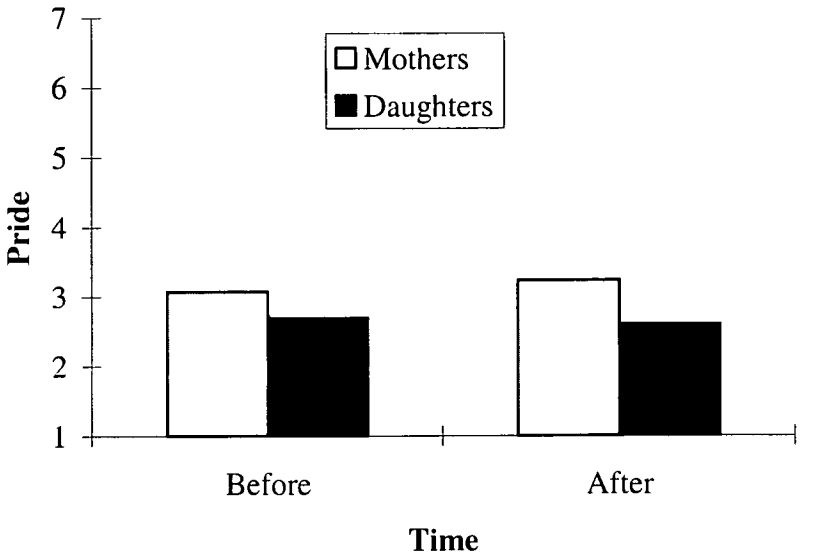

Figure 10. Mean Scores of Pride for Mothers and Daughters Before and After the Conversations.

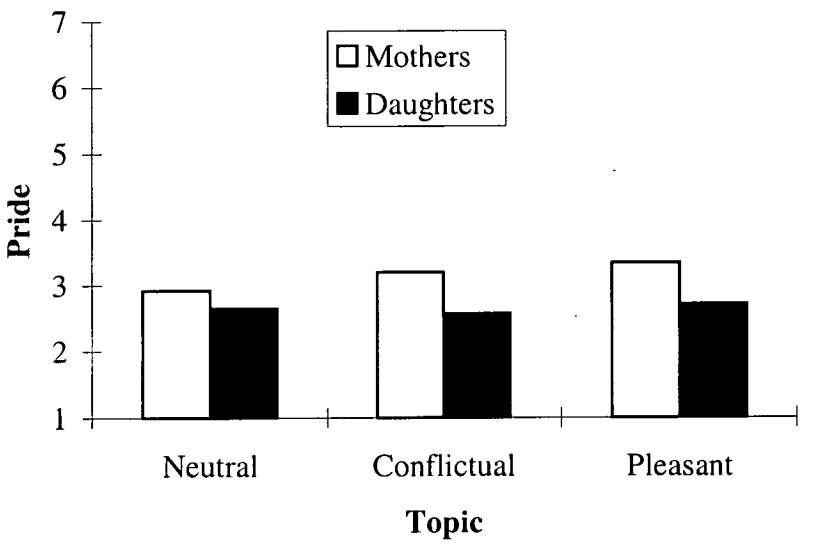

Figure 11. Mean Scores of Pride for Mothers and Daughters for each Conversation Topic.

The ANOVA on modesty yielded no main effect. A significant mother/daughter x topic interaction was found. To interpret the interaction, t-tests were performed and showed that there were no significant differences in modesty between mothers and daughters during the neutral, conflictual and pleasant

conversations. Modesty of daughters did not differ significantly across the three conversation topics, nor did modesty of mothers differ significantly for the conflictual conversation and the neutral or pleasant conversation. However, modesty of mothers was significantly greater for the pleasant conversation (M = 3.27, SD = 1.72) than the neutral conversation (M = 2.83, SD = 1.77), t (62) = -2.96, p = .004.

The ANOVA on gratitude yielded a main effect for time and for topic but not for mother/daughter. A significant time x topic interaction was found. Gratitude increased significantly from before to after the conversations (M_{post} = 3.19, SD = 1.38; M_{pre} = 3.02, SD = 1.29). t-tests indicated that gratitude was significantly greater for the pleasant conversation (M = 3.27, SD = 1.38) than the neutral (M = 3.03, SD = 1.39), t (62) = -2.72, p = .009 or conflictual conversation (M = 3.02, SD = 1.30), t (62) = -2.94, p = .005; but there was no significant difference in gratitude between the neutral and conflictual conversation. However, for the time x topic interaction, t-tests revealed that gratitude increased significantly from before to after the pleasant conversation (M_{post} = 3.48, SD = 1.54; M_{pre} = 3.06, SD = 1.43); however, gratitude did not differ significantly from before to after the neutral or conflictual conversation. Furthermore, there were no significant differences in preconversation gratitude across the three conversation topics; nor were there significantly postconversation differences in gratitude between the neutral and conflictual conversation; however, postconversation gratitude was significantly greater for the pleasant conversation (M = 3.48, SD = 1.54) than the neutral (M = 3.10, SD = 1.59), t (62) = -3.03, p = .004, or conflictual conversation (M = 2.98, SD = 1.33), t (62) = -3.83, $p < .001$.

For Virtue, the ANOVA did not yield any significant main effects or interactions.

Summary. This portion of the findings provided partial support for the predictions (1.5, 1.6 and 1.7) that the levels of pleasant transactional emotions will remain unchanged, decrease and increase during the neutral, conflictual and pleasant conversations respectively. The findings regarding the lack of significant changes in these emotions during the neutral conversation and the impact of the pleasant conversation on increasing the level of gratitude for participants were in predicted directions. The hypothesis (1.9) regarding the effect of the pleasant conversation in producing the highest levels of pleasant transactional emotions was partially upheld. The highest levels of pride and gratitude during the pleasant conversation were in predicted directions. However, for modesty, the prominence of the pleasant conversation was found only for mothers. The ANOVAs on pleasant transactional emotions provided additional information in that mothers experienced greater levels of pride during the pleasant and conflictual conversations than did daughters. The ANOVA on virtue did not yield any significant results.

Unpleasant transactional emotions. This subsection of the data analyses explored the hypotheses (1.5, 1.6 and 1.7) that the levels of unpleasant transactional emotions will remain unchanged, increase and decrease during the neutral, conflictual and pleasant conversations respectively, and that the highest level of unpleasant transactional emotions would be reported during the conflictual conversation (1.8). Table 24 presents mean scores and standard deviations of humiliations, shame, resentment, and guilt for mothers and daughters before and after each conversation topic.

For the unpleasant transactional emotions (UTE), the MANOVA showed significant effects for UTE, Pillai's Trace = .288, F (3, 60) = 8.09, $p < .001$, time,

Pillai's Trace = .089, F (1, 62) = 6.09, p = .016, and topic, Pillai's Trace = .219, F (2, 61) = 8.57, p = .001. There were no significant interactions. To locate the significant effects revealed by MANOVA, separate ANOVAs were conducted on each of the negative transactional emotions. The list of significant main effects and interactions of these ANOVAs is presented in Table 25.

For humiliation, the ANOVA yielded no significant main effects or interactions.

The ANOVA for shame yielded a main effect for topic but not for time or mother/daughter. There were no significant interactions. For the topic effect, t-tests showed that that shame was significantly greater for the conflictual conversation (M = 1.37, SD = 0.52) than the pleasant conversation (M = 1.19, SD = 0.42), t (62) = 3.74, $p < .001$; however, there was no significant differences in shame between the neutral conversation and the conflictual or pleasant conversation.

The ANOVA for shame yielded a main effect for topic but not for time or mother/daughter. There were no significant interactions. For the topic effect, t-tests showed that that shame was significantly greater for the conflictual conversation (M = 1.37, SD = 0.52) than the pleasant conversation (M = 1.19, SD = 0.42), t (62) = 3.74, $p < .001$; however, there was no significant differences in shame between the neutral conversation and the conflictual or pleasant conversation.

Table 24. *Mean Scores and Standard Deviations of Unpleasant Transactional TESI Emotions (Humiliation, Shame, Resentment, and Guilt) for Mothers and Daughters Before and After each Conversation Topic*

	Neutral Topic				Conflictual Topic				Pleasant Topic			
	Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Unpleasant Transactional TESI Emotions	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Humiliation -Before	1.41	0.87	1.48	1.11	1.46	1.04	1.41	0.98	1.33	0.88	1.46	1.01
-After	1.44	0.89	1.38	0.91	1.43	0.78	1.68	1.23	3.51	1.43	1.43	0.98
Shame -Before	1.21	0.74	1.27	0.70	1.35	0.85	1.33	0.74	1.17	0.77	1.24	0.71
-After	1.30	0.85	1.43	1.04	1.32	0.64	1.48	1.00	1.19	0.76	1.16	0.41
Resentment -Before	1.24	0.71	1.56	1.25	1.41	1.03	1.56	1.09	1.11	0.57	1.56	1.22
-After	1.40	1.02	1.67	1.27	1.54	1.04	2.05	1.63	1.17	0.75	1.57	1.07
Guilt -Before	1.44	1.31	1.33	0.86	1.41	1.10	1.35	0.79	1.19	0.62	1.38	0.87
-After	1.38	1.05	1.38	0.96	1.52	1.09	1.68	1.13	1.17	0.75	1.27	0.79

Note. N = 63 dyads.

Table 25. *Signficant Main Effects and Interactions for the ANOVAs on Humiliation, Shame, Resentment and Guilt*

Negative Transactional TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Humiliation	Nil			
Shame	Topic	4.67	1.79, 110.83	.014
Resentment	Mother/Daughter	6.88	1, 62	.011
	Time	10.23	1, 62	.002
	Topic	5.49	1.95, 120.91	.006
Guilt	Topic	5.32	1.84, 114.25	.008
	Time x Topic	5.47	1.71, 106.18	.008

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 63 dyads.

For resentment, the ANOVA yielded main effects for mother/daughter, time, and topic. There were no significant interactions. Resentment was significantly greater for daughters (M = 1.66, SD = 1.03) than mothers (M = 1.31, SD = 0.62). For the time effect, it was shown that resentment increased significantly from before to after the conversations (M_{post} = 1.57, SD = 0.74; M_{pre} = 1.40, SD = 0.65). For the topic effect, t-tests revealed that resentment was significantly greater for the conflictual conversation (M = 1.64, SD = 0.84) than the pleasant conversation (M = 1.35, SD = 0.66), t (62) = 3.45, p = .001; but resentment was not significantly different for the neutral conversation and the conflictual or pleasant conversation.

The ANOVA for guilt yielded a main effect for topic but not for mother/daughter or time. A significant time x topic interaction was found. For the topic effect, t-tests revealed that guilt was significantly greater for the conflictual conversation (M = 1.49, SD = 0.76) than the pleasant conversation (M = 1.25, SD = 0.52), t (62) = 3.55, p = .001; but there was no significant differences in guilt between the neutral conversation and the conflictual or pleasant conversation. For the time x topic interaction, t-tests indicated that guilt increased significantly from before to after the conflictual conversation (M_{post} = 1.60, SD = 0.87; M_{pre} = 1.38, SD = 0.77), t (62) = -3.00, p = .004; however, guilt did not differ significantly from before to after the neutral or pleasant conversation. Also, there were no significant differences in preconversation guilt for the neutral, conflictual or pleasant conversation; but postconversation guilt was significantly greater for the conflictual conversation (M = 1.60, SD = 0.87) than the neutral, t (62) = -2.07, p = .042 or pleasant conversation, t (62) = 4.09, $p < .001$; and postconversation guilt was significantly greater for the neutral conversation (M = 1.38, SD = 0.78) than the pleasant conversation (M = 1.22, SD = 0.55), t (62) = 2.01, p = .049.

Summary. This portion of the results provided partial support for the hypotheses (1.5, 1.6 and 1.7) that the levels of unpleasant transactional emotions would remain unchanged, increase and decrease during the neutral, conflictual and pleasant conversations respectively. The lack of significant changes in these emotions during the neutral conversation and the impact of the conflictual conversation on enhancing the level of guilt were in the predicted directions. The hypothesis (1.8) that the conflictual conversation would generate the highest levels of unpleasant transactional emotions was partially upheld. The prominence of conflictual conversation in producing the highest levels of shame, resentment and guilt confirmed the hypothesis. The ANOVAs also provided additional information in that the lowest level of guilt was reported after the pleasant conversation, the level of resentment (for all conversations) was greater for daughters than for mothers, and the overall impact of all conversations was to increase the level of resentment for participants.

Discussion

Before discussing the hypotheses regarding the predictors of perceived conflict in the family environment and the emotional processes in mother-daughter dyads, it is necessary to interpret the information regarding the initial assessment. This information has relevance to the discussion of the results of this experiment and the subsequent experiments.

Initial Assessments

On average, the level of parenting stress experienced by mothers was low because the mean scores of all categories of parenting stress were below the cut off

points considered as indicating high parenting stress (see Abidin, 1986 for a description and implications of high scores). However, the ranks of attachment, spouse, isolation and life stress were above 50th percentile which is the average standard score in a normal population. Mothers experienced the highest level of parenting stress in the area of attachment (70th percentile) which is relatively close to the cut off score indicating high parenting stress in this area (90th percentile). Abidin (1986) attributes a high score in attachment to the lack of emotional closeness to the child and the parent's real or perceived inability to accurately read and understand the child's feelings and/or needs. Although the mean score on attachment did not reach the cut off point for a high score, its higher percentile rank among other categories of parenting stress confirms the contention that adolescence is characterized by an increasing emotional distance between children and parents (Collins & Luebker, 1994, Graber & Brooks-Gunn, 1999).

The results of the BSI indicate that on average, participants reported a low intensity of psychological symptoms with daughters demonstrating a higher level of psychopathology than mothers. The level of symptomatology for daughters might reflect the challenges of transiting from the period of childhood to adolescence, be accounted for by the parents' inability to facilitate the transition, or be caused by features of their social contexts.

All the mean scores on Active Listening, Confrontation, and Conflict Resolution skills for mothers had a negative value, which implies that mothers made statements which reflected the roadblocks to effective communication rather than the possession of good communication skills. The mean scores indicate that mothers demonstrated the lowest level of effectiveness in Active Listening skills.

The motivational profiles of participants revealed that mothers were predominantly telic (serious-minded, arousal-avoiding), conformist (compliance) and sympathetic dominant. The mothers' conformist dominance concurs with O'Connor's (1992) data whereas mothers' orientation towards telic (arousal-avoiding and serious-mindedness) mode contrasts with her data. Daughters were predominantly serious-minded, arousal-seeking, conformist and sympathetic dominant. The similarity between mothers and daughters in terms of motivational styles may be related to their gender role characteristics. Data from the investigation of other family dyads can explore this assumption further. Given the developmental trend for telic/paratelic dominance (Murgatroyd, 1985b, O'Connor, 1992), the daughters' orientation towards serious-mindedness and arousal-seeking is both contradictory and meaningful. They have an adult's serious-mindedness and a child's arousal-seeking. With respect to the transitory nature of the adolescence period, this data should not be surprising. The finding also confirms the theoretical distinction between arousal-avoidance and the serious-mindedness subscale (Murgatroyd, 1983, cited in Murgatroyd, 1985b) as serious-mindedness is the frequency with which an individual is oriented towards goals whereas arousal-avoidance is the individual's tendency to avoid arousal-provoking situations (Murgatroyd, 1985b).

It was hypothesized (1.4) that daughters would be more paratelic and negativistic dominant than mothers. The findings on MSP partially supported the hypothesis. Daughters were more paratelic dominant because they had significantly lower scores on serious-mindedness dominance and greater scores on arousal seeking dominance. The findings also indicate some unexpected but not surprising outcomes. That mothers had higher scores on autic-mastery dominance is an

indication that they are more inclined to maintain control. In addition to the dominance scores, the subscale scores and the salience scores of mothers and daughters were compared.

The results of MSP show that daughters had significantly lower scores on arousal-avoiding and serious-mindedness subscales and higher scores on arousal-seeking subscale than did mothers. Although there was no significant difference in negativistic (defiance) dominance between mothers and daughters, daughters had significantly higher scores on defiance subscale and lower scores on compliance subscale than did mothers. These outcomes suggest the relative strength of mother-daughter differences in arousal-avoiding and compliance/defiance subscales. The mother-daughter differences in compliance/defiance subscales lends support to the previous data (McDermott, 1988a; O'Connor, 1992) investigating developmental trends in rebelliousness and defiance. Also, the mother-daughter differences in arousal-seeking dominance and in arousal-avoiding, compliance and defiance subscales are consistent with the finding that arousal avoidance and proactive negativism are negatively related (O'Connor, 1992; Tacon & Abner, 1993). The data also revealed that daughters had higher scores on both the autic-mastery and autic-sympathy subscales. These findings indicate that, in spite of greater levels of autic mastery dominance for mothers, the autic subscales is stronger for daughters than for mothers. In comparison, mothers had greater scores on alloic-mastery subscale than daughters suggesting the strength of being other-centered and in control for mothers. With respect to individual tendencies, it was found that mothers were more optimistic and less pessimistic than daughters. The mothers' greater tendency towards optimism and daughters' higher level of pessimism raises a question regarding the extent to which the explanatory styles (Seligman, 1991) and a sense of

loss of control (Burger, 1995) heightened during the period of adolescence, are responsible for these individual tendencies.

The MSP data regarding the salience scores shows that daughters gained higher scores on arousal-avoiding/arousal-seeking and compliance/defiance salience than mothers. These outcomes indicate the importance of these pairs of metamotivational modes for daughters. Given that daughters had signficantly lower scores on arousal-avoiding subscale than mothers, it follows that the mother-daughter differences in arousal-avoiding/arousal-seeking salience are affected by higher scores on arousal-seeking subscale for daughters. Also, daughters had greater scores on autic-mastery/autic-sympathy salience. This outcome is caused by the fact that daughters had significantly higher scores on autic-mastery and autic-sympathy subscales. Daughters' stronger autic-mastery/autic-sympathy, compliance/defaince and arousal-avoiding/ arousal-seeking salience implies that, in dealing with issues during adolescence, they are more self-centered and more focused on negativism and arousal seeking. In comparison, mothers had greater levels of alloic-mastery/alloic-sympathy salience than daughters. Mothers' more alloic salience may reflect their role in the family as a caregiver who has ongoing concern regarding the welfare and happiness of others in the family. However, their higher scores on alloic-mastery subscale indicate that they are also focused on being responsible and in control.

The results of different categories of the perceived family environment for mothers and daughters was very similar to the data of an American sample of 285 normal families (see Moos., Insel, & Humphrey, 1974). The findings of Experiment 1 revealed that mothers perceived their families as more cohesive, expressive, independent, intellectually culturally oriented, organized, moral and religious; and less conflictual than did daughters. These findings are consistent with the recent

findings on the perceived family environment (Ross et al., 1999). The mother/daughter differences in perception of family suggests that mothers have a more positive view on the different factors of the family environment.

The mean scores for different subscales of Issues Checklist were consistent with data from a sample of non-distressed American adolescent-mother dyads reported in Robin and Foster's (1989) study. The results of Experiment 1 showed that topics such as sex, drugs, smoking and going on dates were not chosen by any dyads as the most frequent and intense issue of discussion at home. One possible explanation is that topics like "what time to have meals" or "cleaning the bedroom" are more likely to come up in daily life. It is also possible that mothers and daughters feel uncomfortable discussing emotionally significant issues like sex and drugs. Mothers and daughters did not differ in their report of the intensity, frequency and average anger-intensity of conflictual issues. However, the quantity of issues discussed at home was greater for mothers than for daughters. It is likely that some issues were regarded as conflictual by mothers and neutral by daughters.

To sum up, mothers had low levels of parenting communication skills and reported low levels of parenting stress. Mothers also had more positive perception about their family environments and lower levels of psychological symptoms than did daughters. Both mothers and daughters were predominantly serious-minded, compliant and sympathetic. However, mothers were more oriented towards serious-mindedness, arousal-avoiding, and autic/mastery dominance and less biased towards defiance dominance than daughters. Also mothers were less concerned with arousal-avoiding/arousal-seeking salience and more biased towards alloic salience than daughters. Mothers had higher levels of individual tendency towards optimism and lower levels of individual tendency towards pessimism than daughters.

Predictors of Perceived Conflict in the Family Environment

The first part of Experiment 1 aimed to examine the predictors of perceived conflict in the family environment, the between-group factors for the subsequent experiments.

The hypothesis (1.1) that higher levels of perceived conflict in the family environment would be associated with lower age and education levels was not supported by the data. It is likely that the perceived conflict is related to issues that might neutralize the impact of higher education and maturity of mothers on reducing the level of perceived conflict (e.g., issues like divorce, addiction, traumas or any kind of stressful life events)

The hypothesis (1.2) that higher levels of perceived conflict for dyads would be associated with higher levels of frequency and intensity of conflict issues was partially confirmed. The results demonstrates the strong predictive value of anger-intensity x frequency for mothers (20% of variance for perceived conflict in the family environment). The fact that anger-intensity x frequency for daughters was not a significant predictor may suggests that mothers' reports of frequency and anger intensity of the conflictual issues is a stronger barometer of conflict in the family. The findings also imply that the high level of perceived conflict is not related to how frequently the dyads in a family argue or the level of their anger but to a combination of both.

It was hypothesized (1.1) that higher levels of perceived conflict in the family would be associated with lower levels of parenting skills including Conflict Resolution, Active Listening, Confrontation and the Total Parenting Effectiveness Skills. The hypothesis was partially supported. Among Active Listening, Confrontation, Conflict Resolution and the Total Parenting Effectiveness Skills, only

Conflict Resolution skills predicted a lower level of perceived conflict for dyads. The strong predictive value of Conflict Resolution (21% of variance) is consistent with the literature that many parent-adolescent problems stem from communication difficulties which are partly due to the low level of Conflict Resolution skills (Hughson, 1980). The lack of significant association between other categories of parenting skills and perceived conflict in the family might be due to the fact that the scenarios in PCRS are more appropriate for mothers of primary school children and thus do not reflect the conflictual situations common during the period of adolescence.

It was predicted (1.2) that higher levels of perceived conflict would be associated with higher levels of depression for mothers and daughters. The findings did not support this hypothesis. Instead, the symptom dimensions of Hostility for mothers and Paranoid Ideation for daughters emerged as the predictors of the perceived conflict for dyads. According to Derogatis and Melisaratos (1983), Hostility includes categories of hostile behaviours, thoughts, feelings and actions which lead to feelings of annoyance, irritability, urges to break things, frequent arguments and uncontrollable outbursts of temper. It is likely that in the high-conflict families, mothers engage in hostile behaviour and argument which, in turn, escalate the level of conflict in the family environment. Paranoid Ideation is defined as a mode of thought characterized by projection, hostility, suspiciousness, centrality and fear of loss of autonomy (Derogatis & Melisaratos, 1983). For daughters, the presence of paranoid ideation may be an indication of either the amount of hostility or threat to autonomy they experience in the family. Paranoid Ideation could also be related to the degree to which they project those internal feeling of hostility to other

members of the family, perhaps because of threats to autonomy and the formation of new self-identity.

The prediction (1.2) that higher levels of perceived conflict would be associated with higher levels of perceived control and lower levels of perceived cohesion, independence and expressiveness was partially upheld. The data supported the strong predictive value of perceived control in the family environment (21% of variance in perceived conflict). The positive association between the perceived conflict and the control in the family environment implies the possibility that the control has contributed to the conflict in the family through threatening the adolescents' autonomy. Although perceived cohesion and independence were not the significant predictors, perceived organization emerged as a predictor accounting for 12% of variance in perceived conflict in the family environment. The finding that higher levels of perceived organization were related to lower levels of perceived conflict can be an indication of the poor organization in the family environment of high-conflict families.

The prediction (1.1) that higher levels of perceived conflict would be associated with higher levels of parenting stress for mothers was partially supported by the data. Parenting stress in the area of Role Restriction emerged as a significant predictor accounting for 21% of variance in the perceived conflict for dyads. Abidin (1986) asserts that parenting stress in this area indicates that parents view the parenting role as restricting their freedom and frustrating them in their attempts to maintain their own identity. The parents experiencing this kind of stress view themselves as being controlled and dominated by their children's demands and needs. It is likely that the challenge of dealing with children in the crucial period of mid-adolescence, with the paradoxical aims of both protecting children and fostering their

independence, makes the parenting role very restricting and stressful. Taking into consideration that the majority of mothers were employed, job-related demands added further difficulty to the role of parenting.

It was hypothesized (1.3) that higher levels of perceived conflict would be associated with higher levels of telic and autic-mastery dominance for mothers. The results do not support the hypothesis. There were no dominance score for mothers that emerged as the predictor of perceived conflict for dyads. However, the mothers' individual tendencies towards pessimism predicted the higher level of perceived conflict in the family (11%). The positive association between pessimism and perceived conflict might be an indication that a high level of conflict increases the expectations for the negative outcomes in the family. Furthermore, mothers' salience scores on playful-serious subscales, one of the MSP pair of scales for the telic dominance, was associated with lower levels of perceived conflict in the family (7%). The predictive value of this variable suggests that mothers' high scores on both playful and serious dominance could predict the lower level of perceived conflict for dyads. The emergence of serious-playful salience as a predictor of lower levels of conflict in the family suggests that the salience of some pairs of metamotivational modes could be associated with positive factors in the family environment.

It was postulated (1.3) that higher levels of perceived conflict would be associated with higher levels of paratelic, negativistic and autic-mastery dominance for daughters. The findings did not support this hypothesis. The multiple regression analyses yielded no predictor of perceived conflict among the measures of dominance, individual tendencies and salience for daughters. These findings might be due to the fact that adolescent daughters, in the process of forming new self-concepts undergo many changes in metamotivational dominance/salience and

individual tendencies. It means that an adolescent's metamotivational profile at a specific time may change quickly whereas the level of perceived conflict in the family which might be resulted from unresolved and chronic issues, may change slowly.

Summary. The results of multiple regression analyses confirmed the validity of perceived conflict in the family environment in differentiating two groups of mother-daughter dyads. According to the analyses, none of the demographic factors emerged as the predictors of perceived conflict (1.1). The experience of parenting stress regarding Role Restriction (1.1) and reports of anger-intensity x frequency for current issues of conflict for mothers (1.2) and symptoms dimension of Paranoid Ideation for daughters were the major predictors of perceived conflict for the dyads. The level of perceived organization in the family environment had a substantial impact on lowering the level of perceived conflict reported by dyads while the presence of perceived control in the family accounted for the higher levels of conflict (1.2). The analyses also showed the substantial predictive value of pessimism and playful-serious salience, Hostility symptoms dimension and Conflict Resolution Skills for mothers. It appears that the majority of predictors emerged from mothers' characteristics rather than those of daughters. It is apparent that perceived conflict is associated more with the influence of mothers than daughters in terms of metamotivational styles, psychological symptoms and their perceptions regarding the anger-intensity x frequency of conflict issues.

Emotional Processes in Mother-Daughter Dyadic Interaction

The second part of Experiment 1 explored the emotional processes in mother-daughter dyadic interactions using reversal theory to account for emotional experience. This part explored differences between emotional experiences of mothers and daughters, the impact of the neutral, conflictual and pleasant conversation topics on emotional experience and reversal processes (1.5, 1.6 and 1.7), and a comparison of the impact of the three conversation topics (1.8 and 1.9).

Mother-daughter differences in emotions and metamotivational states. It was hypothesized (1.4) that mothers and daughters would differ in their operative state with mothers being in a more telic state. The hypothesis was not confirmed by the data. It is suggested that the joint participation in the study produced a similar telic state of mind for mothers and daughters. However, the results on the TSM yielded two unexpected mother-daughter differences. Firstly, felt arousal was greater for mothers than daughters. This outcome was consistent with the VAS rating of arousal.

The TESI ratings yielded other unpredicted mother-daughter differences. It was found that boredom and sullenness were significantly greater for daughters than mothers. These outcomes imply that hedonic tone in a paratelic state was lower for daughters than for mothers. Furthermore, boredom for mothers did not significantly differ across conversations. However, boredom for daughters was significantly greater for the neutral conversation than the pleasant conversation. Daughters' greater levels of boredom for the neutral conversation could originate from the low level of arousal in a paratelic state caused by the monotonous nature of this conversation topic and their higher levels of arousal-seeking dominance. The TESI

also revealed that mothers experienced greater pride than did daughters. This is consistent with afore-mentioned data that mothers were more autic-mastery dominant than daughters. Moreover, mothers had lower levels of pride for the neutral conversation than for the conflictual or pleasant conversation. The lack of significant difference between mothers' pride for the conflictual and pleasant topic imply that even an argumentative context could generate transactional gain in a particular metamotivational state.

In the category of unpleasant transactional emotions, there was an unpredicted but not surprising finding. Daughters experienced greater level of resentment than did mothers. Thus, for daughters, conversation with mothers reduced the level of transactional gain desired when one feel sympathetic about oneself. This resentment could be due to the fact that, during conversations, mothers in their autic-mastery state were more self-centered and mastery oriented than alloic-sympathetic. The afore-mentioned data regarding the low level of communication skills for mothers attest to this interpretation.

The findings regarding mother-daughter differences in emotions and metamotivational states point to the key factors related to these differences. It is suggested that the desire for higher levels of arousal (paratelic state) has a strong impact on the emotional experience of daughters. The greater importance of felt arousal for daughters than for mothers is consistent with greater levels of arousal-seeking dominance for daughters. In the area of transactional emotions, the mother-daughter distinctions in pride and resentment indicate the higher levels of autic-mastery and autic sympathy states for mothers and daughters respectively.

The Effects of Different Conversation Topics on Mothers' and Daughters' Emotions and Metamotivational States

The common effects of all conversation topics on emotions and metamotivational states. Before discussing the findings in relation to the hypotheses made for each conversation topic, the common effects of all conversations on the emotions and metamotivational states of mothers and daughters will be explained. It was found that felt arousal, provocativeness and anger increased after the conversations whereas, anxiety, placidity and boredom decreased after the conversations. The findings regarding changes in somatic emotions indicate that a higher level of felt arousal during conversations (while the preconversation emotions reflects the calm and uneventful nature of the baseline phase the postconversation emotions arises during the course of conversation) resulted in a decrease in the low-arousal telic/negativistic emotion of placidity and the low-arousal paratelic/conformist emotion of boredom. The increase in the felt arousal along with a negativist state could be responsible for an increase in the high-arousal telic/negativistic emotion of anger and the high arousal paratelic/negativistic emotion of provocativeness. However, significant decrease in postconversation anxiety may not have originated from the conversation but from a sense of relief that the conversation task is over. A reduction in anxiety can be accounted for by cognitive theories of anxiety, in which the perception of threat is a central issue (Salkovskis, 1996). It is likely that, at the outset of the conversations, uncertainty about the nature and context of the interactions induced high arousal in a telic state which subsided after the conversations. Overall, according to the results, mothers and daughters felt highly aroused and negativistic during conversations. These results are consistent with the finding confirming the relationship between adolescence and expression of

more negative affect (Flannery et al., 1993). Here, there is one mother/daughter difference in terms of the total telic score. Although conversations did not affect the total telic score for daughters, the total telic score of mothers decreased after the conversations. It is suggested that the playful nature of the conversations with an adolescent child has induced a more paratelic state for mothers.

With respect to transactional emotions, it was found that the conversations gave rise to two autic-sympathy emotions of gratitude and resentment. It is suggested that, for participants, the autic-sympathy state increased during the conversations. On the whole, the emotional outcomes of mother-daughter conversations are characterized as increased felt arousal, increased unpleasant somatic emotions and autic-sympathy transactional emotions.

The impact of the neutral conversation on emotions and metamotivational states.. It was postulated (1.5) that, during the neutral conversation, there would be no changes in the operative metamotivational state, and the levels of stress, hedonic tone and emotions. The hypothesis was mostly upheld. The neutral conversation did not significantly affect hedonic tone, arousal (sleepy-active scale), the operative metamotivational state and emotions. However, this conversation reduced the level of stress (the VAS rating), stress from the external factors and effort for body stress for mothers and daughters. It appears that the neutral contents and low intensity of the conversation had a calming effect on the participants.

The impact of the conflictual conversation topic on emotions and metamotivational states. It was hypothesized (1.6) that, for mothers and daughters, the conflictual conversation would increase the levels of telic state, arousal, stress,

unpleasant somatic and transactional emotions and reduce the levels of hedonic tone, pleasant somatic and transactional emotions. The hypothesis was partially upheld. The conflictual conversation increased the level of stress (VAS rating) and decreased the level of hedonic tone (VAS rating). Given the nature and intensity of a conflictual argument, it is appropriate that participants found the conversation stressful and not pleasing.

The significant increase in seriousness and the total telic score indicates that the conflictual conversation induced reversal to the telic state. However, the lack of a significant increase in planning ahead and felt/preferred level of arousal suggests that reversal to the telic state was mostly affected by an increase in the seriousness of participants.

Body tension-stress, body effort-stress and external tension stress did not differ from before to after the conversation. However, the level of effort for external factors increased implying that the participants were conscious of making an effort to cope with the stress from the context of the argument or the presence of the other party.

The conflictual conversation increased the levels of anger and sullenness. These findings indicate that the conversation reduced hedonic tone and this occurred in a negativistic state. With respect to changes in pleasant somatic emotions, the only significant reduction occurred in the level of relaxation. A significant reduction in relaxation indicates that the conversation produced a decreased hedonic tone in the telic/conformist state. The reduction in relaxation and increase in unpleasant somatic emotions are consistent with the reduction in VAS rating of hedonic tone. There was an unexpected finding in the area of pleasant somatic emotions in that the conflictual topic increased the level of provocativeness, a high-arousal emotion of the

negativistic/paratelic state. The outcome indicates the great potential of the reversal theory in accounting for the complexity of emotional experience in that, a conflictual argument is not just characterized by low hedonic tone but can also produce some kind of pleasure in a negativistic state. According to the data, the conflictual topic did not affect the level of pleasant transactional emotions. However, it should be considered that the majority of issues of conflict revolved around low-intensity mundane issues like cleaning the bedroom.

In the area of unpleasant transactional emotions there was a significant increase in the level of guilt suggesting that the conversation generated transactional loss in an alloic-sympathy state. It appears that discussing the issues of disagreement shift the attention of participants from the self and desire for control to attending to and feeling sympathetic towards the concerns and feelings of the other party. This finding has implications for family therapy as to the value and necessity of ongoing discussion of conflict with the aim of mutual understanding between members of the distressed dyads.

Overall, the conflictual conversation has induced reversal to the telic state. Although the conversation had little effect on the level of pleasant somatic emotions, its great impact on the increases in unpleasant somatic emotions demonstrate the existence of a negativistic state for the participants. Despite the fact that the conversation had not affected the level of pleasant transactional emotions, its effect on increasing the level of guilt indicates that the conversation increased transactional loss in an alloic-sympathy state.

The impact of the pleasant conversation topic on emotions and metamotivational states. It was postulated (1.7) that the pleasant conversation would

increase the levels of hedonic tone and pleasant emotions and paratelic state and reduce the levels of stress and unpleasant emotions. The hypothesis was partially supported by the data.

The results revealed that the pleasant conversation did not affect the level of VAS ratings of stress and hedonic tone for the participants. However, the conversation increased the levels of relaxation and excitement for both mothers and daughters suggesting that the hedonic tone in telic/conformist and paratelic/conformist states increased after the conversation. It seems that there were two main effects. First, some people reversed from telic to paratelic state and experienced excitement. Second, some people experienced low felt arousal in a telic state and felt relaxed. An increase in the level of gratitude shows that the pleasant conversation increased transactional gain in an autic/sympathy state. Given the impact of conflictual conversation on an increase in transactional loss of the alloic-mastery state, it is suggested that the conflictual conversation increases the sense of loss from not providing love and harmony for the other party while the pleasant conversation produces a transactional gain from being loved by the other person.

The conversation significantly increased the level of preferred arousal and decreased the level of seriousness and the total telic score. These outcomes indicate that the pleasant conversation induced reversal to a more paratelic state.

Although the VAS rating of stress did not differ significantly before and after the pleasant conversation, the conversation reduced the levels of body stress and effort for stress from external factors. It is suggested that, due to the enjoyable nature of conversation, the participants did not feel any pressure on their body and did not need to make an effort to cope with stress from external factors which would be typical of an intense context. The conversation reduced the level of anxiety for

participants. Given that the conversation increased the levels of relaxation for participants, it seems that some people reversed from telic to paratelic state and experienced excitement and other people who were in the telic state experienced low arousal and hence their anxiety changed to relaxation. The conversation did not affect the levels of unpleasant transactional emotions for mothers and daughters. It should be noted that a vast majority of dyads chose "planning for holidays" as the pleasant issue of discussion. Such a topic is less likely to include contents which have consequences in terms of emotions like resentment, shame, humiliation and guilt. The choice of a pleasant conversation topic with relationship-oriented themes might have yielded different results.

On the whole, the pleasant conversation increased the levels of relaxation, excitement and gratitude and reduced the level of anxiety. The conversation also decreased the levels of body tension-stress and external effort-stress. The results suggest that hedonic tone and transactional gain increased after the conversation.

Comparison of the impact of the three conversation topics on emotions and metamotivational states. With regard to the differences between the impact of the three conversation topics on emotional experiences, the following hypotheses were made;

1.8. It was predicted that the levels of telic state, stress, unpleasant somatic and transactional emotions would be higher for the conflictual conversation than for the neutral or pleasant conversation. The hypothesis was partially upheld. The level of VAS rating of stress was significantly greater for the conflictual conversation than the pleasant conversation. However, the difference between the conflictual and the neutral conversation was not significant. It is suggested that the neutral conversation,

which was an event of the day, might not have been neutral and contained some stressful or worrisome elements. The findings also revealed that body stress, stress for the external factors, effort for stress from external factors were significantly greater for the conflictual conversation than the pleasant and neutral conversation. These outcomes have important implications for the study of emotional processes for dyads in that measures of tension-stress and effort-stress can present new benchmarks for the intensity and awkwardness of the dyadic interactions.

With regard to the components of the telic state, the data yielded significant differences. Seriousness, preference for lower level of arousal and planning ahead was significantly greater for the conflictual conversation than for the neutral or pleasant conversation. This outcome is consistent with the above-mentioned findings that the conflictual and pleasant conversations induced reversal to the telic and paratelic states respectively.

Among the unpleasant somatic emotions, anger and anxiety were greater for the conflictual conversation than for the neutral or pleasant conversation. This data is in consistent with the afore-mentioned finding that TSM ratings of seriousness, preference for low arousal and planning ahead were higher during the conflictual conversation than the two other conversations. For boredom, the impact of the three conversations were the same for mothers. However, boredom for daughters was significantly greater for the neutral conversation than the pleasant conversation suggesting that, for daughters, low arousal during the neutral conversation reduced hedonic tone in a paratelic state.

With regard to the unpleasant transactional emotions, data revealed that the level of humiliation did not differ across conversations. However, shame, resentment and guilt were greater for the conflictual conversation than the neutral or pleasant

conversation. These findings highlight the greater level of transactional loss for the conflictual conversation than the other two conversations. Furthermore, an unexpected result emerged in that guilt was greater for the neutral conversation than the pleasant conversation. It is suggested that the neutral conversation, in comparison to the pleasant conversation, contained more intense negative interpersonal themes that generated more transactional loss in the alloic-sympathy state.

1.9. It was predicted that hedonic tone, and pleasant somatic and transactional emotions would be greater for the pleasant conversation than the neutral or conflictual conversation. The data partially supported the hypothesis.

It was found that VAS rating of hedonic tone was greater for the pleasant conversation than the conflictual conversation. While hedonic tone was greater for the neutral conversation than the conflictual conversation, it did not significantly differ for the pleasant and neutral conversation. Furthermore, mother/daughter differences emerged for VAS rating of hedonic tone. Although for both mothers and daughters, the level of hedonic tone was lower for the conflictual conversation than the neutral conversation, there was a higher level of hedonic tone for the pleasant topic for daughters and not for mothers. This finding indicates that mothers did not find the pleasant conversation as enjoyable as daughters did. This outcome might be related to a non-significant trend in mother-daughter difference in terms of VAS rating of hedonic tone. For mothers, the effect of the conflictual conversation on lowering the level of hedonic tone was greater than the effect of the pleasant conversation on increasing its level.

The findings regarding the pleasant somatic emotions supported the enjoyable quality of the pleasant conversation. The data revealed that relaxation, a low-arousal

telic/conformist emotion, and excitement, a high-arousal paratelic/conformist emotion, were greater for the pleasant conversation than the neutral or conflictual conversation. These findings demonstrate a higher level of hedonic tone in conformist mode during pleasant conversation than the neutral or conflictual conversation. With respect to placidity, a pleasant low arousal telic/negativistic emotion, there were mother/daughter differences. For mothers, placidity was greater for the pleasant conversation than the conflictual conversation whereas daughters experienced higher levels of placidity for the neutral conversation than the conflictual or pleasant conversation. It appears that, for both mothers and daughters the conflictual conversation lowered the level of hedonic tone in the telic/negativistic state. The prominence of the conflictual conversation on reducing lowest level of placidity for mothers concurs with the above-mentioned finding that mothers had a greater level of felt arousal for the conflictual topic. For daughters, the greater impact of the neutral conversation on placidity indicates their low level of arousal in the telic state during this conversation; for those in the paratelic state, this same level of arousal produced a higher level of boredom.

For pleasant somatic emotions, there was an unexpected result. Provocativeness was significantly greater for the conflictual conversation than the two other conversations. The finding implies that an argumentative conversation could produce greater level of hedonic tone in a paratelic/negativistic state than an enjoyable or peaceful conversation.

Among the pleasant transactional emotions, virtue -an alloic/sympathy emotion- did not differ across conversations. However, gratitude, an autic-sympathy emotion, was significantly greater for the pleasant conversation than for the conflictual or neutral topic. For modesty, an alloic-mastery emotion, there were

mother/daughter differences. For daughters, modesty did not differ across conversations whereas modesty for mothers was significantly greater for the pleasant conversation than the neutral conversation. The finding implies that mothers experienced greater levels of transactional gain in an alloic-mastery state during the pleasant conversation than the neutral conversation. The data showed that pride, an autic mastery emotion was greater for the pleasant conversation than for the neutral conversation. However, there were mother/daughters differences in this regard. For daughters, pride did not differ significantly across conversations while mothers experienced lower levels of pride for the neutral conversation than the pleasant or conflictual conversation. This outcome could stem from the finding that pride for the conflictual and pleasant topic was significantly greater for mothers than daughters. The conflictual and pleasant conversations, compared with the neutral conversation, both generated a higher degree of pride for mothers. However, a question arises as to whether the pleasant and conflictual conversations differed in terms of the underlying cognitive and behavioural factors which induced transactional gain in an autic-mastery state. For instance, pride in a pleasant conversation might be a response to the other party's praise whereas pride during a conflictual conversation could be a reaction to a successful defence of an other person's criticism.

On the whole, the results differentiated the three conversation topics in terms of telic/paratelic state, VAS rating of hedonic tone, stress and the pleasant and unpleasant somatic and transactional emotions. The conflictual and pleasant conversations generated unpleasant and pleasant emotions of telic and paratelic states respectively. Higher levels of pleasant and unpleasant somatic/transactional emotions are the distinguishing features of the pleasant and conflictual conversations respectively. This outcome is consistent with the data (Montemayor et al. 1993) that

parents and adolescents experienced more positive affects during the pleasant conversations and more negative affects during the conflictual conversations. In these aspect, the neutral conversation had little, if any impact. However, there are differences between the impact of the three conversation topics which are exclusive to daughters or mothers. It is evident that the neutral conversation had an impact on lowering the level of felt arousal for daughters and thus giving rise to a higher level of boredom and placidity during this conversation than the conflictual or pleasant conversation. The results of this experiment complement the previous literature by presenting data which suggest even a neutral context can elicit negative emotions or a conflictual context could increase hedonic tone in a paratelic/negativistic state.

Conclusion. The second part of Experiment 1 confirmed the significant application of reversal theory in exploring the emotional processes in mother-daughter dyads. The study, focusing on the subjective experience and using the individual appraisal of his/her emotions as the frame of reference, explored areas which had not been investigated by observational studies of emotional expression. The results of this study indicate the capacity of reversal theory concepts to depict the mother/daughter differences in emotional experience. An intriguing outcome that emerged from the results was that the arousal-seeking component of paratelic state combined with a low level of felt arousal plays an important role in emotional outcomes for daughters. This finding, in combination with arousal-seeking dominance for daughters, supports the efficacy of reversal theory concept of dominance in accounting for the emotional processes for dyads. The manipulation of felt level of arousal and telic/paratelic state in the parent-adolescent conversational context could shed light onto a variety of problematic or harmonized relationships in

the family. With respect to transactional emotions, the data distinguished mothers and daughters in experiencing higher levels of autic-mastery and autic-sympathy emotions respectively. However, mothers achieved hedonic tone in autic state and daughters did not. It is suggested that the happiness for both parties may not be attainable unless the focus of concern shifts from the self to the other. This suggestion is in line with the contention posed by Apter and Smith (1985) that "successful and enduring intimate relationships depend on a continuing ability to synchronise reversals in opposite directions on the autic/alloic dimension" (p. 177) The parent and child autic/alloic operative states can be used as a point of intervention in the therapeutic contexts.

Overall, the combined effect of all conversations was increases in the levels of felt arousal and negativistic state which were responsible for a greater level of anger and provocativeness for participants. It is not clear how the negativistic state is related to the fact that conversations increased the autic emotions of resentment and gratitude and did not affect the alloic emotions. Clearly, there is a need to examine the interplay of somatic and transactional pairs of states. The pleasant and conflictual conversations induced reversal to paratelic/conformist and telic/negativistic state respectively. The impact of the conflictual conversation on the level of tension-stress/effort for body and external factors confirmed the utility of these measures in distinguishing the unpleasant interactions for dyads. The comparison of the impact of the three conversations on the level of pleasant and unpleasant somatic/transactional emotions were mostly in predicted directions. Moreover, the results of this study go further to suggest that an unpleasant conversation can increase hedonic tone or a neutral conversation can induce

unpleasant emotions on the basis of the operative metamotivational state of the individual.

Despite the compelling results of this study caution should be exercized in generalizing data to other populations. Given the relative homogeneity of the sample, there is a need to replicate the experiment on more heterogenous samples as socioeconomic and cultural factors may affect the results to a considerable extent. Another limitation concerns the experimental setting which might encourage the participants to behave in a socially desirable manner or choose the issues of discussions which are more comfortable to discuss while under study.

Although methodological limitations raise questions about the application of these results for family therapy, the data can be very useful to therapist dealing with family conflicts. The fact that parent-adolescent conflict and arguments arise in paratelic/negativistic states for adolescents and in the autic-mastery state for mothers has important implications for the family counselling. The counsellors can help the parent-adolescent dyads to learn about the impact of their operative metamotvational state and teach them the necessary skills for state induction when it is required. Therapy can also help the dyads to adopt behavioural styles which are less hurtful and negative to the state of the mind of the other party and which promote communication and mutual understanding of each others perspective.

Chapter 4

Experiment 2

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Emotional and Psychophysiological Processes in High and Low-Conflict Mother-Daughter Dyads

The material concerning the emotional and physiological processes in the low-conflict and high-conflict mother-daughter dyads is introduced in three sections. The first part deals with emotional and physiological processes that occur following observation of dyadic interaction. The second section reviews the empirical data and generates assumptions regarding the metamotivational dominance and emotional processes in the low-conflict and high-conflict mother-daughter dyads. In the third section, hypotheses regarding the individual physiological responding in the low-conflict and high-conflict mother-daughter dyads are developed.

Emotional Responses Following Observation of Dyadic Interaction

In a number of studies, audio-tapes or video-tapes of dyadic interactions have been used to measure emotional and physiological reactions of observing participants. This work includes areas such as client-therapist dyads (Vanderpool & Barratt, 1970) and married couples (Levenson & Gottman, 1983, 1985). These studies used tape-recorded conversations to prevent and/or control the physiological measurement artifacts caused by the movements and fast breathing of the participants that occur during an actual conversation. This methodology assumes that the emotions and psychological reactions of the participants would mirror those which were experienced during the course of actual conversation. Moreover, there are the additional advantages of narrowing the focus of attention to internal feelings and

avoiding any distraction resulting from the flow and contents of the conversations. In this context, the individual, while free from the distractions which stem from the presence of the other party, can concentrate on his/her emotional changes and subjective experiences; and further, the amount and reliability of information is increased.

Metamotivational Dominance in the Low-conflict and High-conflict Mother-Daughter Dyads

To date, there has been no empirical data regarding the metamotivational dominance in low-conflict and high-conflict families. However, the previous findings on motivational styles in parent-child dyads can be used in generating predictions regarding the group differences in metamotivational dominance. O'Connor (1992) found that mothers in her study were less compatible with arousal-seeking and negativistic children than with arousal-avoiding and conformist children. Although incompatibility is not equivalent to interpersonal conflict, it is reasonable to assume that feelings of incompatibility would exist between parent and child during times of conflict. Previous studies on emotional outcomes in high-conflict families could also be a basis for predictions regarding group differences in motivational styles. Conger and Ge (1999) found that increased negative affect and hostility and decreased positive affect towards parents were characteristic of boys and girls in the conflicted families with lower levels of warmth and supportiveness. Capaldi, Forgatch and Crosby (1994) revealed that strong negative affects of anger and contempt were more predictive of the poorer parent-adolescent relationships than were the weaker negative affects of sadness, whining, and anxiety/tension. Given that to feel anger and contempt, one must be in a negativistic metamotivational state,

negativistic dominance can increase the likelihood of experiencing this metamotivational state. In the light of these data, it is predicted that daughters in the high-conflict families would be more arousal-seeking and negativistic dominant than their counterparts in the low-conflict families (hypothesis 2.1).

The metamotivational dominance of parents could also be used as a discriminator of the high-conflict and low-conflict families. The results of Experiment 1 revealed that for mothers individual tendencies towards pessimism was one of the predictors of perceived conflict in the family environment. In comparison, Katz et al. (1999) report evidence that parents who are described as "emotion coaching" were less negative and more positive in interaction with their children and showed less evidence of physiological stress and behavioural problems. Further, these parents had less desire for control and more interest in understanding their children. In this way, the impact of parental orientation towards mastery/sympathy and autic/alloic pairs of metamotivational modes on the quality of parent-adolescent relationship is relevant in conflict situations. It is likely that parents with autic-mastery mode dominance engage in more authoritarian styles and attempt to exert more control on their adolescent child. Conversely, parents with alloic-sympathy dominance, would adopt appropriate parenting styles and thus alleviating the level of conflict in the family. In this way, it is expected that mothers in the high-conflict families would be less alloic-sympathy dominant and more autic-mastery dominant and pessimistic than mothers in the low-conflict families (hypothesis 2.2).

Emotional Processes for the High-conflict and Low-conflict Mother-Daughter Dyads

Dysfunctional emotional responses to others are based on prior learning in relationships and on the influences these experiences have on the way in which

current situations are construed, experienced and reacted to (Greenberg, 1996). Such dysfunctional patterns of emotions are more likely to occur in conflicted families than harmonised ones. A few studies have attempted to explore the effect of dynamics in the family environment on cognitive, affective, behavioural and physiological responses of the individual. Woodball and Matthews (1989) measured the trait anger and hostility of 48 boys and 66 girls in grades 2 to 12 after participation in stress-inducing mental tasks including serial-subtraction and mirror-image writing. The researchers found that children from a less cohesive family environment (measured by the Cohesion subscale of the FES) were more angry and hostile than those from cohesive family. Larkin et al. (1996) explored the emotional reactions of 40 undergraduate students to two interpersonal role-play conflict situations. The study revealed that exposure to a family environment with extreme levels of cohesion (enmeshed or disengaged) and adaptability (chaotic or rigid) produced higher levels of state anxiety during interpersonal conflict than exposure to a family environment with a balanced level of cohesion. Although, the perceived conflict in the family has been identified as the most salient index of the parent-adolescent relationship (Minuchin, 1985; Katz et al., 1992; Graber & Brooks-Gunn, 1999; Hall, 1987; Powers & Welsh, 1999), as a basis for comparison of emotional processes for different groups of parent-adolescent dyads, it has received little attention. The perceived level of conflict in the family environment will be used to differentiate two groups of high-conflict and low-conflict families.

Negative affect has been found to be a discriminator of relationship satisfaction in parent-child dyads (Dix, 1991). Conger and Ge (1999) examined the emotional expressions in 451 families comprising both parents, a son and a daughter. The families were asked to participate in two conversation tasks regarding a general

question about the family life and the greatest conflict in the family. Trained observers rated the video-tapes of the conversations in terms of conflict/hostility and cohesion/warmth/supportiveness. The researchers found that increased negative affects and hostility and decreased positive affect towards parents were characteristics of boys and girls in the conflicted families with lower levels of warmth and supportiveness. Capaldi et al. (1994) conducted problem-solving discussions of high-conflict issues for 200 mid-adolescent boys and their parents. Problem-solving and affective expression were coded using Problem Solving Discussion Rating (see Capaldi et al., 1994) and SPAFF code (see Capaldi et al., 1994). The study revealed that strong negative affects of anger and contempt were more predictive of family outcome than were the weaker negative affects of sadness, whining, and anxiety/tension.

Flannery et al. (1993) used conflictual and pleasant conversation tasks with a sample of 85 two-parent families with adolescents in grades five through nine. Trained observers rated the conversations on the basis of the positive, negative, neutral, mixed and altered affective expressions. The researchers found that parent's affective expression in interactions was consistently related to the adolescent's self-report of relationship conflict more than parent's perceptions of conflict was associated to the adolescent's affective expression. Thus, measurement of perceived conflict in the family environment should include both the parent's and adolescent's viewpoints. It appears that the majority of studies exploring the relationship between family outcomes and emotional processes in parent-adolescent dyads in distinguishing different groups of families have mostly concentrated on adolescents and overlooked the importance of emotional responding by parents. However, previous work which focused on emotional responding by adolescents did not deal

with the distinctive features of parent-adolescent relationship in the low-conflict and high-conflict families. Clearly, there is a gap in the literature in that the previous studies on the emotional processes of different group of families have not included in their comparison the influence of factors such as the parents' desire for control and adolescents' desire for negativity and high arousal. It is likely that the impact of these factors might differ between high and low conflict families. The importance of reversal theory framework for the study of parent-adolescent dyadic interaction was advocated in Chapter 2. The chapter also concluded that the paradoxical nature of adolescence related to both dependency on parents and striving for autonomy and this could be a reason for the great degree of lability in emotional experience. It could also explain greater emotional lability in high-conflict families who are struggling with a lot of issues and deficiencies within their families. The results of Experiment 1 confirmed the relationship between perceived conflict in the family and a variety of factors which can trigger the aversive emotional experience in their own right. Further, the emotional experience in the high-conflict families might be different from that of the low-conflict families.

By introducing pairs of metamotivational states which structure experience and their pattern of alternation, reversal theory presents a new outlook on the nature of high-conflict and low conflict parent-adolescent relationships. The theory not only differentiates the emotional processes of the problematic and harominzed dyads on the basis of positive and negative emotions, but also takes one step further to examine the operative metamotivational state that determines the emotional experience at a given time. Apter and Smith (1979) and Apter (1982, 1989) postulate that many of the parent-child problems arise out of an incompatibility between family members in terms of the telic-paratelic or negativistic-conformist mode

opposition. It is possible that the mode opposition is more significant for parents and adolescents in the high-conflict than the low-conflict dyads. In this respect, the reversal theory measures of metamotivational states and emotions (see Chapter 3) while exploring the negative and positive aspects of emotional experience are capable of exploring the parent-child mode opposition in the two groups of families. One other factor to be considered is that the high-conflict families may be subject to a number of different kinds of stressor as a function of ongoing arguments and unresolved disagreements (Woodball & Matthews, 1989; Altorfer, Kasermann & Hirsbrunner, 1998).

Overall, the previous data on group differences in stress (Woodball & Matthews, 1989) and emotions (Dix, 1991; Conger & Ge, 1991; Capaldi et al., 1994) during parent-child dyadic interaction can lead to two assumptions. First, the levels of unpleasant somatic and transactional emotions would be greater for daughters in the high-conflict dyads than those in the low-conflict dyads (hypothesis 2.3). Second, the high-conflict mother-daughter dyads would experience greater levels of stress and unpleasant somatic/transactional emotions and lower levels of hedonic tone and pleasant somatic/transactional emotions than the low-conflict dyads (hypotheses 2.4 and 2.5).

Psychophysiological Responding to Mother-Daughter Dyadic Interaction

In Experiment 2, the exploration of the psychophysiological processes in mother-daughter dyads concerns two areas of investigations. Firstly individual's responses to the different interactional contexts will be measured; and mother-daughter and group differences will be explored. Secondly, the emotional correlates of the psychophysiological responses will be examined. However, a review of the

relevant studies on psychophysiology of the dyadic interaction is necessary in order to make any predictions about the psychophysiological processes during the mother-daughter dyadic interaction.

Psychophysiological responding to dyadic interaction. The investigation of the psychophysiological processes in dyadic interaction includes the areas of client-therapist dyads and family dyads. Research on the psychotherapeutic interview revealed a correlation between galvanic skin response of the therapist and client and categories of therapist verbalization (McCarron & Appel, 1971) and between observers' rating of patient's antagonism and tension and measures of HR and skin temperature (DiMascio, Boyd, & Greenblatt, 1957). A number of interactional studies have examined the psychophysiology of dyadic interaction in healthy families and those with psychiatric patients. In an attempt to determine the nonverbal, behavioural and physiological indices of stress response, Altorfer et al. (1998) conducted verbal interactional experiments for families with schizophrenic members and a control group. They found a correlation between affectively charged statements and decreased pulse transmission time, and between the nonverbal activity of the patient and the verbal stressors.

Psychophysiological recording has increased the depth of understanding of some aspects of marital and parent-child interaction (Wagner & Calam, 1988). Friedrich, Tyler and Clark (1985) compared the physiological reactions of abusive, neglectful and low-income control mothers to an audio-tape sequence of white noise, tone and infant's crying sounds. Friedrich et al. revealed that what can be seen as primarily interactional psychological problems have demonstrable physiological correlates. Ewart et al. (1984) uncovered the positive impact of communication

training on reduction in hostile exchanges and systolic reactivity during marital interaction. Katz et al. (1992), in their review of research on parent-child, marital and peer group relations, present evidence regarding positive association between higher finger pulse amplitude, negative parenting and anger. Taken together, the psychophysiological studies on client-therapist, marital and parent-child dyads suggest that the autonomic nervous activity of dyads can be influenced by their emotional interaction. The previous studies on the psychophysiology of dyadic interaction in the family have focused on affective expression rated by trained observers. Little is known about the psychophysiology of the subjective experience of emotions.

Physiological responding to emotional experiences. Affective expression may partly reflect the emotional processes during dyadic interaction but it may not indicate the depth and lability of emotional reactions. Apter (1989) commented that "most psychophysiologists have ignored, in their research, the necessity to connect the physiological recording with subjective experience" (p. 67). Levenson and Ruef (1992), in their attempt to explore the relationship between empathy and physiology in marital interaction, used a rotary dial to rate positive and negative emotion. Their findings revealed that accuracy of detecting positive emotion was related to a state of low cardiovascular arousal. However, one may experience moments when either a pleasant emotion (e.g., excitement when watching a race) or an unpleasant emotion (e.g., anxiety) could be related to high physiological arousal. In this regard, reversal theory describes how the same level of physiological arousal can induce different level of hedonic tone depending on the individual's operative metamotivational state. Psychophysiological research on family dyads has not used a sufficiently rich

theoretical framework which could account for the complexity and the dynamics of emotional experience. However, the principal of individual response-stereotypy (Stern, Ray, & Davis, 1980) might make the interpretation of physiological data more difficult if the individual is regarded as inherently inconsistent (Apter, 1982).

The impact of the operative metamotivational states on the psychophysiological responding. The relationship between subjective experience of emotions and physiological responding can not be well understood without taking into consideration the operative metamotivational state of the individual. Kaplan and Bloom (1960) observed that the therapist's heart rate increased in response to the client's antagonism. They interpreted the therapist's reaction as empathy or taking the role of the patient. However, reversal theory offers an alternative explanation for this phenomenon by suggesting that the patient's antagonism induced a reversal of the therapist's state from the alloic-sympathy (feeling empathic towards the patient) to the autic-sympathy state (feeling antagonised by the patient). Coleman, Greenblatt and Solomon (1956) observed session to session changes of the therapist's physiological reactions to the patient's affect and concluded that the therapist might have been preoccupied with his/her own problems. From a reversal theory perspective, it can be argued that the therapist's metamotivational state could be different at various sessions and could change or reverse within a session. Chapter 2 reviewed research on psychophysiological correlates of metamotivational states and dominance and presented evidence that the telic and paratelic state and/or dominance have distinctly different impacts on the physiological arousal of the individual (Apter & Svebak, 1989; Rimehaug & Svebak, 1987; Svebak;1982; Svebak, 1986a; Svebak 1986b; Svebak, 1991; Svebak & Murgatroyd, 1985). Results from these studies

have suggested that higher cardiovascular activity is exhibited by people who are telic-dominant or in the telic state. However, this line of research has mostly focused on arithmetic performance tasks. Therefore, the data obtained in this area may not be relevant to emotional processes in dyads. However, the exploration of the relationship between the physiological responding and metamotivational states can open a new area of investigation for the study of dyadic interaction.

The metamotivational basis of emotions adds further complexity to the relationship between the emotional and psychophysiological processes in dyadic interaction. In this respect, making assumptions about the physiological correlates of emotions could be very difficult. At any given moment, the individual's emotions are amenable to changes in operative somatic and transactional metamotivational state(s). Thus, the prediction regarding the psychophysiological correlates of emotional experience may not be straightforward. During the process of interaction, both somatic and transactional emotions can be experienced simultaneously. However, the above-mentioned studies on the psychophysiology of family and client-therapist dyads have several implications (see Chapter 2 for a detailed review of research). First, the physiological reactions of the individual are associated with his/her hedonic tone and arousal (hypothesis 2.8). Second, contextual factors, such as the type of interaction (neutral, conflictual or pleasant) and familial influences, would impinge on psychophysiological responding of the individual. In the next section, the findings of previous studies on dyadic interaction will be used to generate assumptions regarding the impacts of contextual factors and perceived conflict on the individual physiological responding in mother-daughter dyads.

Psychophysiological processes in different interpersonal contexts. The study of physiological processes during dyadic interaction in the family has its start in the analysis of client-therapist pairs (Notarius & Herrick, 1989). Coleman et al. (1956) reported that, over a series of 44 interviews, the patient's highest, lowest and intermediate heart rate occurred during period of anxiety, depression, and hostility respectively. DiMascio et al. (1957), in their study on the therapist-client interview, revealed a strong correlation between the patient's expression of tension, antagonism (e.g., impatience, nervous habits, anxious emotionality, demonstration of shame or guilt, signs of frustration) and the heart rate of both patient and therapist. Further, the receiving and sending of criticism, conflict, or confrontation expressed in client-therapist dyads has been found to be associated with increases in autonomic activity (DiMascio et. al., 1957; McCarron & Appel, 1971). Malmo et al. (1957), in their study on the therapeutic interview, found a correlation between non-relaxation and relaxation of muscle tension after criticism and praise respectively. Given the possibility of different levels of criticism, praise, and pleasant and unpleasant emotions for the conflictual and pleasant interactions, it is likely that different interpersonal contexts can give rise to differentiated autonomic activities, although the factors like the operative metamotivational state of the individual, felt level of arousal, and overall hedonic tone may interplay with the effect of the interpersonal context.

Empirical evidence clearly documents that higher levels of family conflict causes higher psychophysiological arousal among disputants (Levenson & Gottman, 1983, 1985). The findings on the client-therapist dyads imply that, in the context of conflictual interaction with the possibility of criticism, antagonism and tension,

greater psychophysiological arousal is more likely than in the neutral or pleasant interaction (hypothesis 2.6).

Psychophysiological processes for low-conflict and high-conflict mother-daughter dyads. Many behavioural, affective, and cardiovascular response patterns are learnt, based upon observation and learning experiences that occur within the family environment (Larkin et al., 1996). Lower Cohesion in the family has been found to be associated with a greater cardiovascular arousal in response to an arithmetic task (Woodball & Matthews, 1989) or stress, and to greater levels of anger and hostility (Wright et al., 1993). Larkin et al. (1996) examined the physiological, affective, and behavioural responses of 41 young males to two interpersonal role-play conflict situations. The researchers found that males who were exposed to family environments with extreme levels (very low or very high) of cohesion (enmeshed or disengaged) and adaptability (chaotic or rigid) exhibited higher HR responses, state anxiousness, negative nonverbal and verbal behaviour during conflictual discussions than those who were exposed to family environments with balanced levels of cohesion and adaptability.

In addition to cohesion, perceived conflict in the family has stimulated a line of research in the area of psychophysiological processes in dyadic interaction. Empirical evidence clearly documents that family conflict causes higher psychophysiological arousal among disputants (Levenson & Gottman, 1983, 1985). In a follow up study of marital interaction, Levenson and Gottman (1985) found that physiological arousal was not reflective of the present state of interaction but as an indicator of decline in marital satisfaction. In the light of the previous research on

psychophysiology of dyadic interaction it is predicted that physiological arousal would be greater for the high-conflict than the low-conflict dyads (hypothesis 2.7).

Aims and Hypotheses

The aims of this experiment are: Firstly, to compare two groups of high-conflict and low-conflict mother-daughter dyads in terms of operative metamotivational state; arousal; stress; tension/effort-stress for body and external factors; and pleasant/unpleasant somatic and transactional emotions; and secondly, to examine the psychophysiological processes for the high-conflict and low conflict mother-daughter dyads during the neutral, conflictual and pleasant conversations. The experiment also aims to investigate the emotional predictors of physiological responding during mother-daughter dyadic interaction.

Hypotheses: It is predicted that;

2.1. Daughters in the high-conflict families would be more arousal-seeking and negativistic dominant than their counterparts in the low-conflict families.

2.2. Mothers in the high-conflict families would be less alloic-mastery dominant and more autic-mastery dominant and pessimist than their counterparts in the low-conflict families.

2.3. Daughters in the high-conflict families would experience greater levels of unpleasant somatic and transactional emotions than daughters in the low-conflict group.

2.4. Both mothers and daughters in the high-conflict group would experience greater levels of stress, unpleasant somatic and transactional emotions than those in the low-conflict group.

2.5. Both mothers and daughters in the low-conflict group would experience greater levels of pleasant hedonic tone and pleasant somatic and transactional emotions than those in the high-conflict group.

2.6. Physiological arousal would be greater for the conflictual conversation than the neutral or pleasant conversation.

2.7. Physiological arousal would be greater for the high-conflict dyads than the low-conflict dyads.

2.8. Physiological changes would be associated with the felt arousal and hedonic tone.

Method

Participants

Participants in Experiment 2 were two groups of twelve mother-daughter dyads. Mothers' age ranged from 32.9 to 55.7 (M = 43.4, SD = 6.1) and daughters' age ranged from 13.9 to 17.5 (M = 15.1, SD = 0.9).

It was aimed to form two groups of dyads with lowest (low-conflict group) and highest scores (high-conflict group) on Conflict in the Family Environment (CFE). Raw score on CFE was used as the basis for group selection of Experiment 2. The CFE score of each dyad was obtained by averaging mother's and daughters' individual ratings of perceived family Conflict. Pearson correlation shows that there was high correlation between dyads' CFE scores with mothers' scores (r = 0.90, p < .001) and with daughters' rating (r = 0.94, p < .001). Initially, 15 dyads were included in each group. However, due to unforseen participant drop out, the number of dyads in each group was reduced to 12. Therefore, from the 63 dyads in

Experiment1, two groups of 12 dyads with extreme CFE scores completed this experiment. The CFE scores for the low-conflict group ranged from 0.5 to 4.5 (M =1.79, SD =1.45). The scores for the high-conflict group ranged from 5.0 to 8.0 (M =6.17, SD =1.11).

Apparatus

The audio-tapes of conversations were played through a TC-D5M Sony tape-recorder in equipment room. Each participant listened to the audio-tapes via a headphone.

Five psychophysiological responses were recorded using a Power Macintosh 7300/180 computer linked to a MacLab/8E data acquisition system using Chart version 3.5.6 software. Recordings were made with a sampling frequency of 200/s. The responses recorded and channel settings were as follows;

Channel 1. The electrocardiograph (ECG) was measured using 7mm Ag/AgCl electrodes fitted on both sides of the torso at the level of second rib with an earth reference on the left mastoid process. The electrodes were input through a BioAmp coupler: amplifier range was 2 mV full scale and the band-pass filter was 0.3 to 50 Hz.

Channel 2. The ECG signal was input to a second channel and converted to beat-to-beat heart rate (HR): the cardiotachometer range setting was 0 to 200 beats/min.

Channel 3. Finger pulse amplitude (FPA) was measured using a photoelectric plethysmograph fitted to the distal phalange of the second finger of the non-dominant hand using a velcro fastener. The plethysmograph was connected through a GP Amp

coupler with the amplifier range set at 20 to 100mV and band-pass filtering from 0.3 to 10 Hz.

Channel 4. Skin conductance level (SCL) was recorded using 9mm Ag/AgCl contoured electrodes fitted to the distal phalange of the first and third fingers of the non-dominant hand with velcro fasteners and connected to a GSR coupler with the range setting at 10 μS.

Channel 5. Respiration measurement used a Pneumotrace respiratory belt secured around the top of the chest just under the armpits and connected to a GP Amp coupler with range set at 100 to 200mV and band pass filter setting of 0.3 to 10 Hz.

Measures

The measures in Experiment 2 consist of physiological measures, psychological ratings and the measures of metamotivational states, somatic and transactional emotions

1. Physiological Measures:

As it will be seen in the Design section, a part of design involved the impact of the independent variables on the physiological responses of the participants. Thus, the descriptions and measurement techniques of the physiological measures are presented in the following section.

Heart Rate (HR). Hear rate is one of the most commonly used physiological measures in the studies of emotions. "Heart is innervated by both the sympathetic

and parasympathetic branches of the Autonomous Nervous System. The sympathetic nervous system prepares the body to respond to emergencies (stress), to strong emotions such as anger or fear and to strenuous activity" (Taylor, 1999, p.21). The parasympathetic nervous system reduces the activity of the heart and particularly influences heart rate, whereas the sympathetic system increases the activity of the heart and particularly affects the pumping function (Stern et al., 1980). A number of factors influence the rate at which the heart contracts and relaxes. Exercise, emotional excitement, or stress, diet, posture, pathology and mental activity could lead to high heart rate (tachycardia) or low heart rate (bradycardia) (Stern et al., 1980; Taylor, 1999).

Finger Pulse Amplitude (FPA). Pulse volume, as a function of sympathetic nervous system activity, is a measure related to both the pumping action of the heart and vasoconstriction or vasodilatation in the periphery-demonstrated by cold feet and hands or flushing or blushing during emotional arousal. The magnitude of an individual pulse is the difference between a lowest point and the peak of a pulse (Stern et al., 1980). Increased sympathetic nervous system activity produces decreases in FPA (Brownley, Hurwitz, & Schneiderman, 2000).

In this experiment, the FPA percentage scores were calculated by dividing the mean scores for early conversation or late conversation by the baseline mean scores and multiplying the product by 100. The percentages from baseline to each of the two thirty-second listening periods which were less than 100 represent vasoconstriction, scores of more than 100 represent vasodilatation.

Pulse Wave Transmission Time (PWTT). PWTT is the time required for the pulse wave to travel from the heart to a distant location (Stern et al., 1980). There is evidence that PWTT covaries with systolic blood pressure under most conditions (see Stern et al., 1980). In this study, the R wave of the QRS complex in the ECG was used as the pulse initiation time and PWTT was derived as the time to the maximum pulse wave in the FPA record.

Skin Conductance Level (SCL). The tonic electrodermal activity is referred to as the skin conductance level. The ecrine sweat glands, concentrated in the palms of the hands and the soles of the feet, respond primarily to psychic stimulation. The ecrine sweat glands are innervated by the sympathetic branch of the ANS. Depending on the degree of sympathetic activation, the hydration of the skin with salty sweat increases the skin conductance level (Stern et al., 1980).

Respiration Rate (RESP). Respiration is modified by both the central nervous system and the autonomic nervous system, particularly the parasympathetic branch (Stern et al., 1980). Arousal of the body via the sympathetic nervous system serves to increase the respiration rate and the amount of air flowing into the lungs. The parasympathetic activity reverses the changes produced by sympathetic activation and decreases the respiration rate (Taylor, 1999).

The respiration rate per minute was measured by counting the number of complete breaths in each 30-second selection and estimating the proportion of any portion of breaths at the beginning and end of that selection and multiplying the product by 2.

Respiratory Sinus Arrhythmia (RSA). Respiratory Sinus Arrhythmia refers to the rhythmic increases and decreases in heart rate produced by normal respiration in many subjects. As the subjects inhales and exhales, heart rate increases and decreases respectively (Stern, 1980). "RSA is considered to be a noninvasive index of cardiac parasympathetic (vagal) tone" (Lane, Adcock, & Burnett, 1992, p. 461). Lane et al. (1992) found that higher RSA scores were negatively correlated with higher blood pressures and positively associated with faster adaptation of heart rate during stress, which suggests the development of parasympathetic antagonism to ongoing sympathetic arousal. Slower respiration rate increases RSA. The effect of respiratory rate on heart rate is usually greater for young and slim people (Stern, 1980). There is some evidence regarding positive association between RSA and pleasant affect (see Porges, 1995).

RSA was calculated using the peak-trough method (Porges & Byrne, 1992); the difference between maximum and minimum HRs associated with each respiratory cycle and averaged over the number of breaths on each selection was used as an index of mean RSA.

2. *Psychological Ratings, Measures of Metamotivational States and Emotions*

The Visual Analogue Scales (VAS) (McCormack et al., 1988). VAS were used for psychological ratings of overall stress (calm-worried), arousal (sleepy-active) and hedonic tone (pleasant-unpleasant) for mothers and daughters. The description and scoring of the VAS are the same as described in Chapter 3.

The Telic State Measure (TSM) (Svebak & Murgatroyd, 1985). TSM was used to examine seriousness, planning ahead, felt and preferred level of arousal, and the total telic score for mothers and daughters. The description and scoring of the TSM have been described in Chapter 3.

The Tension and Effort Stress Inventory (TESI) (Svebak, 1987). The TESI was used to measure tension/effort-stress from body and external factors, and somatic and transactional emotions. The description and scoring of the TESI have been described in Chapter 3.

Procedure

The dyads were given a short description of the second experiment and their voluntary participation sought. At the beginning of the session, the participants were briefed and asked to sign consent forms for Experiment 2 and Experiment 3. Each member of the dyad went through the experiment separately. The order of participation for mother and daughter was counterbalanced in different pairs. The participants were told:

> A while ago, you had three conversations with each other which were recorded on an audio- tape recorder. You discussed three different topics including an issue of conflict, a pleasant issue, and the event of the day. Do you remember them? Now, you are going to listen to the same tapes with some electrodes attached to your body which will measure your heart rate, pulse change, skin conductance response and respiration. The attachment of these electrodes will produce minimal, if any, discomfort. You will also be

asked by microphone to rate your emotion on short scales before and after listening to each conversation.

After this introduction to the Experiment, the necessary instructions regarding TESI, TSM and VAS were given. Then, the researcher went to an adjacent equipment room and started monitoring the responses on the Mac Lab recording system. The three five minute pleasant, neutral and conflictual mother-daughter conversations were played for the participants in a counterbalanced order. Each conversation was proceeded by a five minute baseline during which participants were asked to relax and think about a neutral event like making a cup of coffee or taking a dog for a walk. The baselines were planned in order to return the arousal level of participants to the pre-conversation stage. Immediately before each conversation topic (after the baseline preceding that conversation topic) and after each conversation topic (i.e., before the baseline preceding the next conversation topic) participants were asked to fill out the TESI, TSM and VAS. The physiological recording took place during the baselines and conversation topics and was stopped during TESI, TSM and VAS ratings. At the end of the session, the participants were debriefed.

Design

Four kinds of design were used for Experiment 2. The first part of the study involved comparison of metamotivational dominance scores for high and low conflict mothers and daughters (hypotheses 2.1 and 2.2). The data were collected as a part of Experiment 1 (see description). Records for participants in Experiment 2 were analyzed to determine within-group and between-group differences in scores on

metamotivational subscales, dominance and salience and the individual tendencies. The second part was a correlational study examining the predictors of the individual physiological responding among measures of psychological ratings, emotions and metamotivational states (hypothesis 2.8).

The third design was used to examine the emotional responses to the three different conversation topics for the low-conflict and high-conflict mother-daughter dyads (hypotheses 2.3, 2.4 and 2.5). To compare the two groups in terms of metamotivational states and emotional concomitants before and after listening to their conversation, a mixed (within-subject and between-group) repeated measures design was used. The between-group factor was Conflict (high and low-conflict). Within-subject variables were Mother/Daughter, Time (before and after conversation) and Topic (neutral, conflictual and pleasant). The dependent variables were the metamotivational states; stress; arousal; hedonic tone, tension/effort-stress from body and external factors; pleasant and unpleasant somatic and transactional emotions.

The fourth design was used to examine within-subject and between-group differences in physiological measures (hypotheses 2.6 and 2.7). To compare the physiological responses of the two groups, a mixed (within-subject and between-group) repeated measures design was used. The between-group factor was Conflict (high and low-conflict). Within-subject variables were Mother/Daughter, Time (baseline, early conversation and late conversation) and Topic (neutral, conflictual and pleasant). The dependent variables were HR, SCL, FPA, RSA, PWTT and RESP. It is necessary to mention that, for the physiological measures, scores were extracted for a thirty -second pre-listening baseline recording and 2 thirty-second

periods at the early stage and towards the end of each conversation topic. The reason for selecting these segments was to measure the physiological changes from the baseline section period to the early and late periods of each conversation.

Data analysis

To explore mother-daughter and group differences in metamotivational dominance, t-tests were used. As there were 120 t-tests, the *p* value of .01 was used because of multiple tests on variables which are likely to be correlated. This increased *p* value protects for the increased probability of Type 1 error but still maintains some control over Type 2 error rate.

The emotional responses during listening to the conversations were analyzed using 2 (Mother/Daughter) X 2 (Time: Before/After) X 3 (Topic : Neutral, Conflictual and Pleasant) X 2 Conflict (Low-conflict/High-Conflict) repeated measures ANOVAs. ANOVAs, with Greenhouse-Geisser corrections for repeated measures, were employed to assess the change in each dependent variable across all of the independent variables. ANOVA and t-tests were performed to identify the source of significant main effects or interactions as appropriate.

The physiological responses during listening to the conversations were analyzed using 2 (Mother/Daughter) X 3 (Time: Baseline, Early Conversation and Late Conversation) X 3 (Topic : Neutral, Conflictual and Pleasant) X 2 Conflict (Low-conflict/High-Conflict) repeated measures ANOVAs. ANOVAs, with Greenhouse-Geisser corrections for repeated measures, were employed to assess the change in each dependent variable across all of the independent variables subjects

(see Vassey & Thayer, 1987). ANOVA and t-tests were performed to identify the source of significant main effects or interactions as appropriate.

To examine the predictors of physiological responding, separate series of stepwise multiple regression analyses were performed for mothers and daughters. In order to achieve an acceptable ratio of variables to subjects, it was necessary to perform a number of separate analyses on smaller numbers (subsets) of variables (see Tabachnick & Fidell, 1989).). The analyses aimed to explore the contribution of post-conversation rating of operative states, arousal, stress and emotions to the level of psychophysiological responding during the late conversation period of each topic. The reason behind choosing the late conversation period of physiological responding was the consideration that the physiological responses during this period could be more related to the post-conversation rating of states and emotions than are those during the baseline and early conversation periods where emotions and arousal were likely to be still changing. In each analysis, one of the psychophysiological measures was used as the criterion variable. The subsets of predictor variables were arousal, stress and hedonic tone (analysis 1); seriousness, planning ahead, felt arousal, preferred arousal and the total telic score (analysis 2); stress for external factors, body stress, effort for external factors and effort for body stress (analysis 3); relaxation, anxiety, boredom and excitement (analysis 4), placidity, anger, provocativeness and sullenness (analysis 5); pride, humiliation, modesty and shame (analysis 6); and gratitude, resentment, virtue and guilt (analysis 7). Due to the sensitivity of multiple regression analysis to outliers, scores three standard deviations beyond the mean scores were replaced by the mean scores (see Tabachnick & Fidell, 1989).

Results

Mother-Daughter and Group Differences in Motivational Styles

For this portion of findings, descriptive statistics were used to depict the motivational profiles of mothers and daughters in the low-conflict and high-conflict groups, also, the t-tests were used to explore the following hypotheses;

2.1. Daughters in the high-conflict families would be more arousal-seeking and negativistic dominant than their counterparts in the low-conflict families.

2.2. Mothers in the high-conflict families would be less alloic-mastery dominant and more autic-mastery dominant and pessimist than their counterparts in the low-conflict families

Table 26 presents the mean scores and standard deviations of MSP subscales, dominance and salience scores and individual tendencies for optimism, pessimism, emotionality and effortfullness for mothers and daughters in the low-conflict and high-conflict groups.

To examine mother/daughter and group differences in motivational styles for the participants in Experiment 2, 120 t-tests were performed. To control for Type 1 error rate, a critical value of $p < .01$ was used. The results of these t-tests exploring the group differences in mothers' and daughters' metamotivational styles are displayed in Table 27. Table 28 summarizes the analyses of mother-daughter differences in motivational styles in the combined (df = 23), low-conflict (df = 11) and high-conflict group (df = 11). It is necessary to mention that the same data appears in Tables 26, 27 and 28 but was reorganized in order to facilitate the comparisons of the t-tests.

Table 26. *Mean Scores and Standard Deviations of the MSP Subscales,Dominance and Salience Scores and the Individual Tendencies for Optimism, Pessimism, Emotionality and Effortfulness for the Combined, Low-conflict and High-conflict Mothers and Daughters (N = 24 dyads)*

	Combined				Low-conflict				High-conflict			
	Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Motivational Style Profile												
Subscales												
Serious-mindedness	21.13	2.98	19.96	2.8	22.25	3.19	19.50	2.71	22.00	2.89	20.42	2.94
Playfulness	17.25	3.01	18.75	3.35	17.83	2.29	19.17	3.01	16.67	3.60	18.33	3.75
Arousal-Avoiding	20.17	2.88	18.79	3.50	20.67	3.08	18.67	3.55	19.67	2.71	18.92	3.60
Arousal-seeking	14.75	3.25	19.29	4.80	14.83	3.30	18.83	5.46	14.67	3.34	19.75	4.25
Defiance	10.38	2.41	13.00	3.62	11.00	2.49	12.58	2.87	9.75	2.26	13.42	4.34
Compliance	21.29	3.17	20.00	4.96	22.42	3.53	19.83	2.66	20.17	2.41	20.17	6.66
Autic-Matery	16.83	3.14	17.88	3.26	16.00	3.52	17.42	2.81	17.67	2.61	18.33	3.73
Autic-Sympathy	20.13	4.79	21.58	4.03	19.33	3.52	21.08	3.06	20.92	5.84	22.08	4.91
Alloic-Mastery	24.13	2.77	21.38	3.65	24.58	3.32	21.00	4.16	23.67	2.15	21.75	3.19
Alloic-Sympathy	25.54	3.01	23.71	3.84	25.75	3.57	22.33	4.72	25.33	2.46	25.08	2.11
Optimism	20.63	3.33	19.70	3.80	21.00	3.57	19.73	2.89	20.25	3.19	19.67	4.68
Pessimism	11.92	3.81	13.80	4.46	10.42	3.23	12.25	3.52	13.43	3.86	15:35	4.90
Emotionality	18.71	4.80	18.88	4.00	15.83	3.24	18.17	4.06	21.58	4.44	19.58	3.99
Effortfulness	22.08	2.59	22.04	4.18	21.50	3.12	21.50	4.20	22.67	1.87	22.83	2.17
Dominance												
Serious-Playful	4.88	3.83	1.21	4.20	4.42	4.15	0.33	4.38	5.33	3.60	2.08	3.99
Arousal-Avoiding/Arousal-Seeking	5.42	4.67	-0.92	5.32	5.83	5.11	-1.00	6.32	5.00	4.37	-0.83	4.37
Defiant-Compliant	-11.33	4.60	-7.75	4.59	-11.42	4.94	-7.25	3.70	-11.25	4.45	-8.25	5.46
Autic-Mastery/Autic-Sympathy	-3.29	4.79	-3.71	4.50	-3.33	4.42	-3.67	3.03	-3.25	5.33	-3.75	5.75
Alloic-Mastery/Alloic-Sympathy	-1.42	2.48	-2.25	2.52	-1.17	2.66	-1.33	2.35	-1.67	2.39	-3.17	2.44
Salience												
Serious-Playful	39.38	4.61	38.71	4.54	40.08	3.70	38.67	3.70	38.67	5.45	38.75	5.43
Arousal-Avoiding/Arousal-Seeking	34.92	3.99	38.08	6.47	35.50	3.83	37.55	6.61	34.33	4.23	38.67	6.56
Defiant-Compliant	32.08	3.86	33.58	3.90	33.42	3.58	32.42	4.12	30.75	3.79	34.75	3.44
Autic-Mastery/Autic-Sympathy	36.96	6.53	39.46	5.79	35.33	5.48	38.50	5.04	38.58	7.30	40.42	6.54
Alloic-Mastery/Alloic-Sympathy	49.67	5.22	45.42	6.92	50.33	6.36	43.33	8.57	49.00	3.95	47.50	4.12

Table 27. *The Results of Muliple T-tests for Group Differences in the MSP Subscales, Dominance and Salience Scores, and the Individual Tendencies for Optimism, Pessimism, Emotionality and Effortfulness for Mothers and Daughters (N = 24 dyads)*

	Mothers						Daughters					
	Low-conflict		High-conflict		Differences		Low-conflict		High-conflict		Differences	
	M	*SD*	*M*	*SD*	t-value	Sig	*M*	*SD*	*M*	*SD*	t-value	Sig
Motivational Style Profile					(df = 22)						(df = 22)	
Subscales												
Serious-mindedness	22.25	3.19	22.00	2.89	0.20	.840	19.50	2.71	20.42	2.94	-0.79	.436
Playfulness	17.83	2.29	16.67	3.60	0.95	.360	19.17	3.01	18.33	3.75	0.60	.555
Arousal-Avoiding	20.67	3.08	19.67	2.71	0.84	.408	18.67	3.55	18.92	3.60	-0.17	.866
Arousal-seeking	14.83	3.30	14.67	3.34	0.12	.903	18.83	5.46	19.75	4.25	-0.46	.651
Defiance	11.00	2.49	9.75	2.26	1.29	.211	12.58	2.87	13.42	4.34	-0.56	.585
Compliance	22.42	3.53	20.17	2.41	1.83	.083	19.83	2.66	20.17	6.66	-0.16	.874
Autic-Matery	16.00	3.52	17.67	2.61	-1.32	.202	17.42	2.81	18.33	3.73	-0.68	.504
Autic-Sympathy	19.33	3.52	20.92	5.84	-0.80	.432	21.08	3.06	22.08	4.91	-0.60	.555
Alloic-Mastery	24.58	3.32	23.67	2.15	0.80	.431	21.00	4.16	21.75	3.19	-0.50	.625
Alloic-Sympathy	25.75	3.57	25.33	2.46	0.33	.743	22.33	4.72	25.08	2.11	-1.84	.079
Optimism	21.00	3.57	20.25	3.19	0.54	.593	19.73	2.89	19.67	4.68	0.04	.967
Pessimism	10.42	3.23	13.43	3.86	-2.07	.051	12.25	3.52	15.35	4.90	-1.78	.090
Emotionality	15.83	3.24	21.58	4.44	-3.62	.002*	18.17	4.06	19.58	3.99	-0.86	.398
Effortfulness	21.50	3.12	22.67	1.87	-1.11	.281	21.50	4.20	22.83	2.17	-0.93	.364
Dominance												
Serious-Playful	4.42	4.15	5.33	3.60	-0.58	.570	0.33	4.38	2.08	3.99	-1.02	.317
Arousal-Avoiding/Arousal-Seeking	5.83	5.11	5.00	4.37	0.43	.670	-1.00	6.32	-0.83	4.37	-0.08	.941
Defiant-Compliant	-11.42	4.94	-11.25	4.45	-0.09	.930	-7.25	3.70	-8.25	5.46	0.53	.605
Autic-Mastery/Autic-Sympathy	-3.33	4.42	-3.25	5.33	-0.04	.967	-3.67	3.03	-3.75	5.75	0.04	.965
Alloic-Mastery/Alloic-Sympathy	-1.17	2.66	-1.67	2.39	0.49	.633	-1.33	2.35	-3.17	2.44	1.87	.074
Salience												
Serious-Playful	40.08	3.70	38.67	5.45	0.75	.470	38.67	3.70	38.75	5.43	-0.44	.965
Arousal-Avoiding/Arousal-Seeking	35.50	3.83	34.33	4.23	0.71	.490	37.55	6.61	38.67	6.56	-0.43	.668
Defiant-Compliant	33.42	3.58	30.75	3.79	1.77	.090	32.42	4.12	34.75	3.44	-1.51	.147
Autic-Mastery/Autic-Sympathy	35.33	5.48	38.58	7.30	-1.23	.232	38.50	5.04	40.42	6.54	-0.80	.430
Alloic-Mastery/Alloic-Sympathy	50.33	6.36	49.00	3.95	0.62	.545	43.33	8.57	47.50	4.12	-1.52	.149

Table 28. *The Results of Multiple T-Tests for Mother-Daughter Differences in the MSP Subscales, Dominance and Salience Scores, and the Individual Tendencies for Optimism, Pessimism, Emotionality and Effortfulness for the Combined, Low-conflict and High-conflict Mothers and Daughters (N = 24 dyads)*

	Combined				Low-conflict				High-conflict			
	Mothers	Daughters	Differences		Mothers	Daughters	Differences		Mothers	Daughters	Differences	
	M	*M*	t-value	Sig	*M*	*M*	t-value	Sig	*M*	*M*	t-value	Sig
Motivational Style Profile			(df = 23)				(df = 11)				(df = 11)	
Subscales												
Serious-mindedness	22.13	19.96	3.74	.001*	22.25	19.50	3.88	.003*	22.00	20.42	1.73	.112
playfulness	17.25	18.75	-2.37	.027	17.83	19.17	-1.65	.128	16.67	18.33	-1.65	.127
Arousal-Avoiding	20.17	18.79	1.58	.128	20.67	18.67	1.41	.187	19.67	18.92	0.72	.485
Arousal-seeking	14.75	19.29	-3.93	.001*	14.83	18.83	-2.11	.059	14.67	19.75	-3.67	.004*
Defiance	10.38	13.00	-3.65	.001*	11.00	12.58	-1.69	.121	9.75	13.42	-3.53	.005*
Compliance	21.29	20.00	0.16	.259	22.42	19.83	2.28	.043	20.17	20.17	< 0.01	1.000
Autic-Matery	16.83	17.88	-1.18	.249	16.00	17.42	-1.32	.215	17.67	18.33	-0.46	.652
Autic-Sympathy	20.13	21.58	-1.33	.196	19.33	21.08	-1.40	.189	20.92	22.08	-0.63	.542
Alloic-Mastery	24.13	21.38	3.45	.002*	24.58	21.00	3.54	.005*	23.67	21.75	1.56	.147
Alloic-Sympathy	25.54	23.71	2.19	.045	25.75	22.33	2.52	.029	25.33	25.08	0.27	.789
Optimism	20.63	19.70	0.93	.361	21.00	19.73	0.87	.401	20.25	19.67	-1.31	.218
Pessimism	11.92	13.80	-1.89	.072	10.42	12.25	-1.30	.219	13.43	15.35	1.29	.223
Emotionality	18.71	18.88	-1.15	.880	15.83	18.17	1.83	.095	21.58	19.58	-0.14	.888
Effortfulness	22.08	22.04	0.06	.954	21.50	21.50	0.27	.789	22.67	22.83	-2.03	.067
Dominance												
Serious-Playful	4.88	1.21	3.99	.001	4.42	0.33	3.13	.010*	5.33	2.08	2.40	.035
Arousal-Avoiding/Arousal-Seeking	5.42	-0.92	4.47	< .001*	5.83	-1.00	2.60	.025	5.00	-0.83	4.87	< .001*
Defiant-Compliant	-11.33	-7.75	-3.05	0.006*	-11.42	-7.25	-2.57	.026	-11.25	-8.25	-1.72	.114
Autic-Mastery/Autic-Sympathy	-3.29	-3.71	0.34	.738	-3.33	-3.67	0.22	.829	-3.25	-3.75	0.25	.809
Alloic-Mastery/Alloic-Sympathy	-1.42	-2.25	1.07	.295	-1.17	-1.33	0.16	.879	-1.67	-3.17	1.32	.214
Salience												
Serious-Playful	39.38	38.71	0.85	0.407	40.08	38.67	1.81	.098	38.67	38.75	-0.61	.953
Arousal-Avoiding/Arousal-Seeking	34.92	38.08	-2.17	0.041	35.50	37.55	-0.99	.346	34.33	38.67	-2.03	.067
Defiant-Compliant	32.08	33.58	-1.54	0.138	33.42	32.42	0.77	.459	30.75	34.75	-3.73	.003*
Autic-Mastery/Autic-Sympathy	36.96	39.46	-1.60	0.123	35.33	38.50	-1.78	.103	38.58	40.42	-0.70	.500
Alloic-Mastery/Alloic-Sympathy	49.67	45.42	3.02	0.006*	50.33	43.33	3.27	.007*	49.00	47.50	0.98	.349

In Table 26, the mean scores of the metamotivational dominance for the combined, low-conflict and high-conflict groups shows that, on average, mothers were predominantly serious-minded, arousal-avoiding, compliant and sympathetic dominant (in terms of both autic-mastery/autic-sympathy and alloic-mastery/alloic-sympathy pairs); and daughters were predominantly serious-minded, arousal-seeking, compliant and sympathetic dominant (in terms of both autic-mastery/autic-sympathy and alloic-mastery/alloic-sympathy pairs).

Table 27 indicates that there were no significant differences in MSP scores between daughters in the two groups. Also, individual tendency towards emotionality was greater for mothers in the high-conflict group than those in the low-conflict group. There was a non-significant trend regarding the greater levels of pessimism for mothers in the high-conflict group than their counterparts in the low-conflict group.

Table 28 highlights the mother-daughter differences in MSP scores for the combined, low-conflict and high-conflict groups. In the combined group, mothers had greater scores on serious-mindedness subscale and dominance than did daughters. Although mothers had lower scores on the playful subscale, the difference failed to reach significance. Also, arousal-avoiding dominance was greater for mothers than daughters. Daughters had greater scores on arousal-avoiding/arousal-seeking salience than mothers; however, the difference failed to reach significance. Also, the scores for arousal-seeking subscale were greater for daughters than mothers. With regard to the compliance dominance, daughters had significantly lower scores than did mothers. Also, the scores on defiance subscale were greater for daughters than mothers. Furthermore, the scores on alloic-mastery/alloic-sympathy salience and alloic-mastery subscale were greater for mothers than daughters.

Although the scores on alloic-sympathy subscale were greater for mothers than daughters, the difference failed to reach significance. The t-tests showed that mother-daughter differences in some measures of the motivational styles varied across groups. In the low-conflict group, mothers had significantly greater scores on serious-mindedness subscale and dominance. For the high-conflict group, mothers had greater scores on serious-mindedness dominance; however, the difference failed to reach significance. In the high-conflict group, mothers had greater scores on arousal-avoiding dominance and lower scores on arousal-seeking subscale than did daughters. For the low-conflict group, arousal-avoiding dominance was greater for mothers than daughters; however the difference failed to reach significance. In the high-conflict group, the scores for defiance-compliance salience and defiance subscale was greater for daughters than for mothers. For the low-conflict group, mothers had lower scores on defiance dominance and higher scores on compliance subscale than daughters; however, the difference failed to reach significance. In the low-conflict group, alloic-mastery/alloic-sympathy salience, and the alloic-mastery subscale were significantly greater for mothers than daughters. For this group there was a non-significant trend regarding higher scores on alloic-sympathy subscale for mothers than daughters. These mother-daughter differences were not observed in the high-conflict group.

Summary. The findings regarding the group differences in motivational styles did not support the above-mentioned hypotheses (2.1 and 2.2) that daughters in the high-conflict families would be more arousal-seeking and negativistic dominant than their counterparts in the low-conflict families, and mothers in the high-conflict families would be less alloic-mastery dominant and more autic-mastery dominant and

pessimist than their counterparts in the low-conflict families. However, the t-tests provided additional information in that emotionality was greater for mothers in the high-conflict group than those in the low-conflict group. The findings also yielded mother-daughter differences which were exclusive to each of the groups. In the high-conflict group, the scores on arousal-seeking subscale, arousal-seeking dominance, defiance subscale and compliance-defiance salience were greater for daughters than mothers. In the low-conflict group, the scores on alloic-mastery subscale and alloic-mastery/alloic-sympathy salience were greater for mothers than daughters.

Psychological Responses to the Neutral, Conflictual and Pleasant Topics for the Low-conflict and High-conflict Groups

This results of the ANOVAs on different ratings of VAS, TSM and TESI were used to explore the hypotheses 3-5 of Experiment 2 as follows;

2.3. Daughters in the high-conflict families would experience greater levels of unpleasant somatic and transactional emotions than daughters in the low-conflict group.

2.4. Both mothers and daughters in the high-conflict group would experience greater levels of stress, unpleasant somatic and transactional emotions than those in the low-conflict group.

2.5. Both mothers and daughters in the low-conflict group would experience greater levels of pleasant hedonic tone and pleasant somatic and transactional emotions than those in the high-conflict group.

In the following ANOVAs, the main effect for conflict and the mother/daughter x conflict interaction will be used to examine the hypotheses. Other

main effects (mother/daughter, topic and time) and interactions will be used to further explore the hypotheses of Experiment 1. For the purpose of clarity, in each of the following subsections of data, each of the above-mentioned hypothesis will be broken down to describe the specific part of that hypothesis which is relevant to that part of data.

Psychological ratings of stress, arousal and hedonic tone. This subsection of the data analyses tested the hypotheses (2.4 and 2.5) that both mothers and daughters in the high-conflict group would experience greater levels of stress, unpleasant somatic and transactional emotions than those in the low-conflict group, and both mothers and daughters in the low-conflict group would experience higher level of pleasant hedonic tone than those in the high-conflict group. Table 29 presents mean scores and standard deviations of psychological ratings of stress (calm-worried scale), arousal (sleepy-active scale) and hedonic tone (unpleasant-pleasant scale) for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on these ratings is displayed in Table 30.

Table 29. *Mean Scores and Standard Deviations of Psychological Ratings of Stress, Arousal and Hedonic Tone for Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Psychological Ratings		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
Stress	-Before	23.58	16.56	12.17	13.74	24.92	19.14	20.42	23.31	26.83	17.38	16.83	16.44
	-After	27.17	19.16	14.75	18.39	30.92	17.84	17.42	17.07	27.17	17.47	11.83	14.93
Arousal	-Before	45.58	17.68	34.58	30.21	56.25	25.55	46.83	32.24	54.17	23.56	47.75	29.35
	-After	57.17	19.95	46.83	33.36	62.92	14.76	49.75	32.04	56.17	14.87	48.58	32.50
Hedonic Tone	-Before	70.25	19.62	80.58	13.95	71.08	21.02	84.00	15.72	77.00	19.88	79.92	19.71
	-After	70.00	24.18	76.33	20.42	66.75	18.90	76.50	20.46	76.58	20.29	86.92	15.02
High-conflict Group													
Stress	-Before	23.92	18.64	29.08	26.00	19.75	22.97	20.08	17.80	18.83	16.55	16.42	12.69
	-After	27.25	22.86	24.08	23.62	40.42	21.23	36.08	25.26	24.50	20.15	31.25	25.62
Arousal	-Before	55.67	28.69	39.25	29.10	44.58	32.36	39.25	30.09	43.67	28.60	32.75	25.83
	-After	52.58	20.90	41.08	29.30	63.92	15.00	39.50	13.65	57.75	20.99	39.50	13.66
Hedonic Tone	-Before	75.83	19.71	67.50	26.57	75.00	23.31	70.08	22.00	79.83	18.57	75.25	21.94
	-After	74.92	14.38	64.33	29.90	59.67	19.80	47.92	22.96	78.08	17.94	66.83	26.67

Note. N = 24 dyads.

Table 30. *Significant Main Effects and Interactions for the ANOVAs on Psychological Ratings of Stress, Arousal and Hedonic Tone for Mothers and Daughters in the Low-conflict and High-conflict Groups (N = 24 dyads)*

Psychological Ratings	Significant Main Effects and Interactions	*F*	df	*p*
Stress	Time	6.99	1, 22	.015
	Time x Conflict	5.05	1, 22	.035
	Time x Topic x Conflict	4.15	1.38, 30.40	.039
Arousal				
	Mother/Daughter	7.45	1, 22	.012
	Time	6.93	1, 22	.015
Hedonic Tone				
	Time	8.42	1, 22	.008
	Topic	9.22	1.59, 35.05	.001
	Time x Topic	7.25	1.30, 28.50	.001

Note. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures.

For stress, the ANOVA yielded a main effect for time but not for mother/daughter, topic or conflict. There were significant interactions for time x conflict, and time x topic x conflict: means are graphed in Figure 12. Stress increased significantly from before to after the conversations (M_{pre} = 21.07, SD = 11.36; M_{post} = 26.07, SD = 13.67). To interpret the time x conflict interaction, t-tests were performed and showed that, for the high-conflict dyads, stress increased significantly from before to after the conversations (M_{pre} = 21.35, SD = 13.00; M_{post} = 30.60, SD = 16.74), t (11) = -3.17, p = .009. Such increase was not found for the low-conflict group. To explore the time x topic x conflict interaction, separate 2 x 2 (conflict x time) ANOVAs were conducted for each topic. None of the ANOVAs on the three topics yielded a significant main effect for conflict or time. For the ANOVA on the neutral conversation, there was no significant interaction. A significant time x conflict interaction occurred for the ANOVA on the conflictual, F (1, 22) = 4.77, p = .040, and pleasant conversation, F (1, 22) = 5.33, p = .031. To interpret the interactions, t-tests were performed. The t-tests revealed that, for the pleasant and conflictual conversations, preconversation stress did not differ for the two groups. For the pleasant and conflictual conversation, postconversation stress was not significantly different for the two groups. The interaction was due to the high-conflict group in which stress increased significantly from before to after both the conflictual (M_{pre} = 19.92, SD = 15.90; M_{post} = 38.25, SD = 21.23), t (11) = -3.34, p = .007, and pleasant conversation (M_{pre} = 17.63, SD = 13.60; M_{post} = 27.88, SD = 19.03), t (11) = -2.21, p = .049.

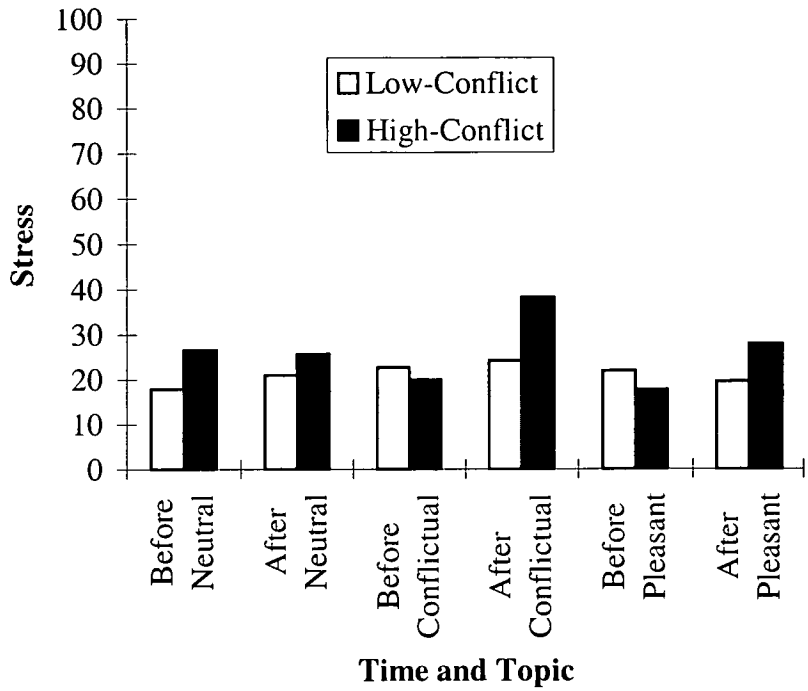

Figure 12. Mean Scores of Stress for the Low-Conflict and High-Conflict Groups Before and After each Conversation Topic.

For arousal, the ANOVA yielded a main effect for mother/daughter and for time but not for topic or conflict. Arousal was significantly greater for mothers (M = 54.20, SD = 16.46) than daughters (M = 42.14, SD = 24.91). Arousal increased significantly from before to after the conversations (M_{post} = 51.31, SD = 17.03; M_{pre} = 45.03, SD = 20.97).

For hedonic tone, the ANOVA yielded a main effect for time and for topic but not for mother/daughter or conflict. A significant time x topic interaction was found. Hedonic tone decreased significantly from before to after the conversations (M_{pre} = 75.53, SD = 12.30; M_{post} = 70.40, SD = 13.46). t-tests revealed that there were no significant differences in hedonic tone for the neutral and the conflictual conversation. However, hedonic tone was significantly higher for the pleasant conversation (M = 77.55, SD = 13.39) than the neutral (M = 72.47, SD =13.06), t (23)

= -3.58, p = .002 or conflictual conversation (M = 68.88, SD = 13.76), t (23) = -3.52, p = .002. To interpret the time x topic interaction, t-tests were performed and showed that hedonic tone did not differ significantly from before to after the neutral or pleasant conversation. However, hedonic tone decreased significantly from before to after the conflictual conversation (M_{pre} = 75.04, SD = 14.30; M_{post} = 62.71, SD = 17.81), t (23) = 3.58, p = .002. The t-tests indicated that pre-conversation hedonic tone was significantly higher for the pleasant conversation (M = 78.00, SD = 13.62) than the neutral conversation (M = 73.54, SD = 13.66), t (23) = -2.62, p = .015. Also, post-conversation hedonic tone was significantly higher for the pleasant conversation (M = 77.10, SD = 15.60) than the neutral (M = 71.40, SD = 14.30), t (23) = -3.25, p = .004, or conflictual conversation (M = 62.71, SD = 17.81), t (23) = -3.94, p = .001, and post-conversation hedonic tone was significantly higher for the neutral conversation than the conflictual conversation, t (23) = 2.60, p = .016.

Summary. The results of the ANOVAs on the psychological rating of stress, arousal and hedonic tone did not support any of the hypotheses (2.4 and 2.5) that the level of stress would be greater for the high-conflict group than the low conflict group, and the level of pleasant hedonic tone would be greater for the low-conflict group than the other group. However, for the ANOVA on stress, the time x topic x conflict interaction revealed additional information in that the impact of conflictual and pleasant conversations on increasing the stress levels was exclusive to the high-conflict group. The main effects for time showed increases in arousal and stress and decreases in hedonic tone from before to after the conversations. The ANOVAs also revealed the higher levels of arousal for mothers than daughters. The highest level of hedonic tone for the pleasant conversation topic supported the hypothesis of

Experiment 1 (1.9) that the level of hedonic tone would be greater for the pleasant conversation than the other two conversations.

Measures of telic/paratelic state. This part of the data analyses did not test any hypothesis but was used to explore the group differences in the operative telic/paratelic state. Table 31 presents mean scores and standard deviations of seriousness, planning ahead, felt and preferred level of arousal and the total telic score for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on these measures are presented in Table 32.

For seriousness, the ANOVA yielded a main effect for time and topic but not for mother/daughter or conflict. A significant mother/daughter x time x topic interaction was found, and means are graphed in Figure 13. Seriousness decreased significantly from before to after the conversations (M_{pre} = 3.86, SD = 0.58; M_{post} = 3.66, SD = 0.69). Seriousness was significantly greater for the conflictual conversation (M = 4.04, SD = 0.69) than the neutral (M = 3.77, SD = 0.63), t (23) = -2.97, p = .007, or pleasant conversation (M = 3.46, SD = 0.70), t (23) = 5.28, $p <$ .001. Also, seriousness was significantly greater for the neutral conversation than the pleasant conversation, t (23) = 3.25, p = .004.

Table 31. *Mean Scores and Standard Deviations of Seriousness, Planning Ahead, Felt Arousal, Preferred Arousal and The Total Telic State Measure (TSM) for Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
TSM Subscales and Total		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
Seriousness	-Before	3.78	0.56	3.92	1.24	4.01	0.71	3.95	1.20	3.45	1.10	3.62	1.25
	-After	3.47	1.13	3.46	1.25	3.87	0.80	4.01	1.38	3.00	0.79	3.44	1.40
Planning Ahead	-Before	3.48	0.98	3.13	1.28	3.72	0.88	3.47	1.14	3.70	0.80	3.13	1.16
	-After	3.49	0.91	3.00	1.16	3.84	0.49	3.39	1.44	3.36	0.72	3.06	1.27
Felt Arousal	-Before	2.77	0.98	3.11	0.74	3.26	1.24	2.92	1.05	3.03	1.01	2.73	0.82
	-After	3.65	1.16	3.29	0.98	3.58	0.67	4.22	0.96	3.56	1.25	3.70	1.13
Preferred Arousal	-Before	3.05	1.05	3.32	0.84	3.18	1.07	3.19	1.01	2.93	1.04	3.02	0.81
	-After	3.71	1.17	3.17	0.88	3.19	0.78	3.11	1.18	3.69	1.15	3.27	1.17
Total TSM	-Before	11.23	1.84	10.74	1.18	11.60	1.96	11.22	1.21	11.18	1.83	10.73	1.83
	-After	10.25	2.65	10.21	1.37	11.51	1.85	11.20	2.67	9.75	2.02	10.23	2.45
High-conflict Group													
Seriousness	-Before	3.92	1.06	3.97	0.79	4.42	0.83	3.66	1.11	3.89	1.09	3.65	1.06
	-After	3.84	1.31	3.77	1.13	4.05	1.07	4.35	0.79	3.08	1.01	3.55	1.33
Planning Ahead	-Before	3.92	0.94	3.73	1.07	4.11	0.97	3.51	1.22	4.04	1.03	3.39	1.10
	-After	3.93	1.07	3.76	1.18	3.78	1.07	3.71	0.91	3.50	0.90	3.62	1.37
Felt Arousal	-Before	3.19	1.01	2.52	1.09	2.99	1.09	3.09	1.18	3.05	1.08	3.02	1.02
	-After	3.45	0.91	3.06	1.08	3.62	0.90	3.88	0.84	3.79	0.99	3.36	1.19
Preferred Arousal	-Before	3.32	0.93	3.17	1.26	3.01	1.04	3.50	1.24	2.98	1.05	3.70	1.24
	-After	3.43	0.95	3.46	1.34	3.41	0.77	3.26	1.22	3.55	1.04	3.69	1.33
Total TSM	-Before	11.55	2.49	11.48	2.95	12.52	2.26	10.69	3.33	11.96	2.71	10.35	2.93
	-After	11.35	2.71	11.06	3.44	11.51	2.21	11.80	2.35	9.96	2.62	10.40	3.36

Note. N = 24 dyads

Table 32. *Significant Main Effects and Interactions for the ANOVAs on Seriousness, Planning Ahead, Felt Arousal, Preferred Arousal and The Total Telic State Measure (TSM) for Mothers and Daughters in the Low-conflict and High-Conflict Groups (N = 24 dyads)*

TSM Subscales and Total	Significant Main Effects and Interactions	*F*	df	*p*
Seriousness	Time	6.60	1, 22	.018
	Mother/Daughter x Time x Topic	3.79	1.93, 42.44	.032
Planning Ahead	Nil			
Felt Arousal	Time	37.49	1, 22	< .001
	Topic	5.41	1.72, 37.87	.011
	Mother/Daughter x Topic	3.28	1.94, 42.74	.049
Preferred Arousal	Time	6.11	1, 22	.010
	Mother/Daughter x Time	9.84	1, 22	.005
The Total TSM	Time	8.03	1, 22	.010
	Topic	8.26	1.84, 40.57	.001
	Mother/Daughter x Time	7.77	1, 22	.011

Note. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures.

To interpret mother/daughter x time x topic interaction, separate 2x2 (mother/daughter x time) ANOVAs were conducted for each topic. There were not significant effects for the neutral topic. For the conflictual topic, a significant mother/daughter x time interaction was found, F (1, 22) = 7.47, p = .012, and t-tests showed that seriousness of daughters increased significantly from before to after the conflictual conversation (M_{post} = 4.18, SD = 1.11; M_{pre} = 3.81, SD = 1.14), t (23) = -2.56, p = .017. For the pleasant topic, the ANOVA showed a main effect for time, F (1, 22), p = .031, but not for mother/daughter. Seriousness decreased significantly from before to after listening to the pleasant conversation (M_{pre} = 3.65, SD = 0.75; M_{post} = 3.27, SD = 0.86).

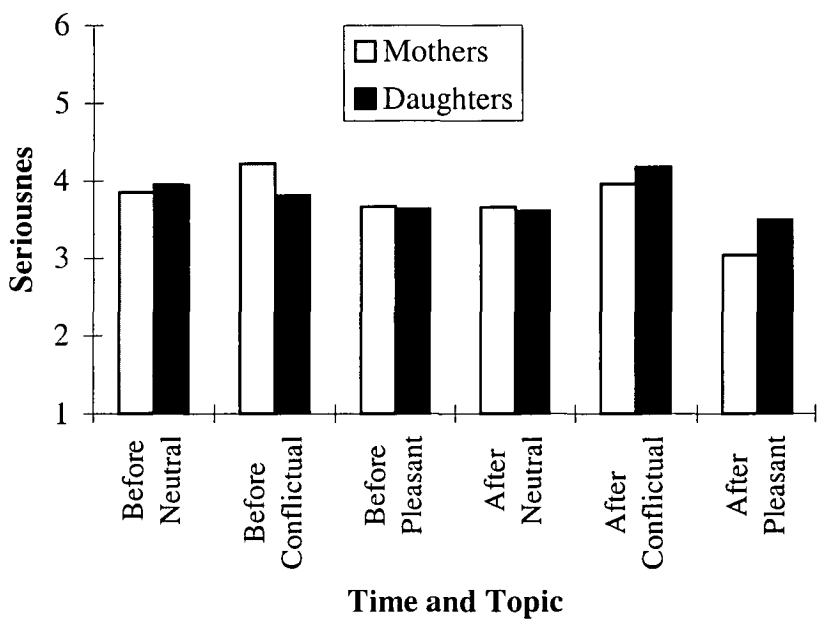

Figure 13. Mean Scores of Seriousness for Mothers and Daughters Before and After each Conversation Topic.

The ANOVA on planning ahead did not yield any significant main effects or interactions.

For felt arousal, the ANOVA yielded main effects for time and topic but not for mother/daughter or conflict. There was a significant interaction for mother/daughter x topic, and means are graphed in Figure 14. Felt arousal increased significantly from before to after the conversations (M_{pre} = 2.97, SD = 0.73; M_{post} = 3.60, SD = 0.63). t-tests between topics showed that the only significant difference was that felt arousal was greater for the conflictual conversation (M = 3.44, SD = 0.70) than the neutral conversation (M = 3.13, SD = 0.70), t (23) = -3.44, p = .002. To interpret the mother/daughter x topic interaction, t-tests were performed and indicated that there was no significant difference in felt arousal between mothers and daughters for the neutral, conflictual or pleasant conversations. Felt arousal of daughters was significantly greater for the conflictual conversation (M = 3.53, SD = 0.86) than the neutral, t (23) = -4.20, $p < .001$, or pleasant conversation, t (23) = 2.32, p = .029. Felt arousal for mothers did not differ significantly across the three conversation topics.

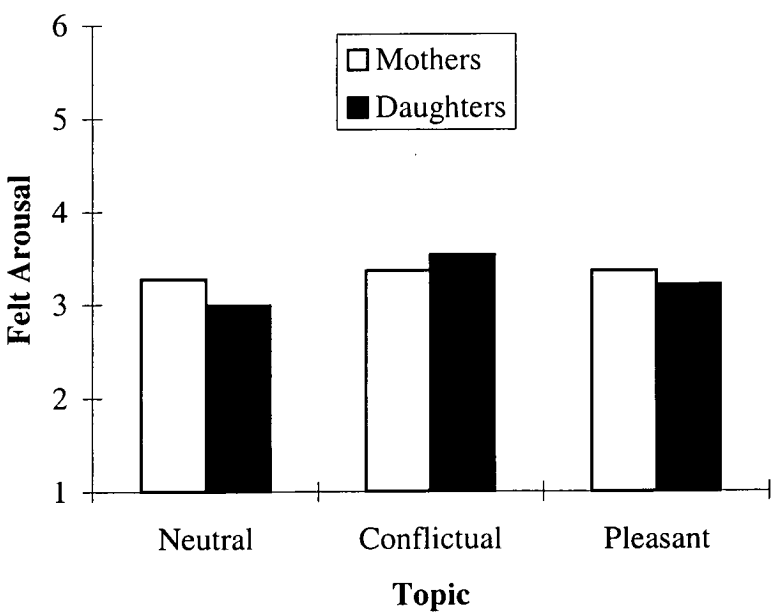

Figure 14. Means Scores of Felt Arousal for Mothers and Daughters for each Conversation Topic.

The ANOVA on preferred arousal yielded a main effect for time but not for mother/daughter, topic or conflict. A significant mother/daughter x time interaction was found. The preferred level of arousal increased significantly from before to after the conversations (M_{post} = 3.41, SD = 0.74; M_{pre} = 3.20, SD = 0.83). To interpret the mother/daughter x time interaction, t-tests showed that there was no significant difference in preferred arousal between mothers and daughters before or after the conversations. The interaction was due to the preferred arousal of mothers which increased significantly from before to after the conversations (M_{pre} = 3.08, SD = 0.91; M_{post} = 3.50, SD = 0.73), t (23) = -3.52, p = .002.

The ANOVA on the total telic score yielded a main effect for time and for topic but not for mother/daughter or conflict. A significant mother/daughter x time interaction was found. The total telic score decreased significantly from before to after the conversations (M_{pre} = 11.27, SD = 1.62; M_{post} = 10.77, SD = 1.61). t-tests showed that the total telic score was significantly greater for the conflictual conversation (M = 11.51, SD = 1.63) than the neutral (M = 10.98, SD = 1.64), t (23) = -2.26, p = .034, or pleasant conversation (M = 10.57, SD = 1.78), t (23) = 3.70, p = .001. To interpret the mother/daughter x time interaction, t-tests revealed that the total telic score of mothers decreased significantly from before to after the conversations (M_{pre} = 11.67, SD = 1.93; M_{post} = 10.72, SD = 1.84), t (23) = 3.12, p = .005, while there was no difference for daughters.

Summary. The ANOVAs on different subscales of the TSM did not yield any significant effects involving conflict. The ANOVAs revealed that the conversations resulted in decreased levels of seriousness and the total telic score for mothers, and increased the levels of felt arousal for daughters and preferred arousal for mothers.

The findings of this section provided partial support for the hypotheses of Experiment 1 that the conflictual conversation would increase the levels of the telic state for mothers and daughters (1.6), and that, among the three conversations, the conflictual conversation would induce the highest levels of the telic state for participants (1.8). The conflictual conversation increased the levels of seriousness for daughters. Among the three conversation topics, the conflictual conversation produced the highest level of the total telic scores for dyads. The finding that the pleasant conversation induced the highest level of felt arousal for daughters contradicted the hypothesis of Experiment 1 (1.8) that the level of arousal would be greater for the conflictual conversation than the neutral or pleasant conversation.

Tension/effort-stress from body and the external factors. In addition to the findings regarding the VAS rating of stress, this subsection of the data analyses also examined the hypothesis (2.4) that the level of stress would be greater for the high-conflict group than the low-conflict group. However, this part of the results explored the hypothesis with respect to different ratings of TESI tension/effort stress from body and external factors. Table 33 displays mean scores and standard deviations of tension/effort-stress from body and external factors for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The ANOVAs on tension/effort-stress from body and external factors did not yield any main effects or significant interactions.

The pleasant somatic emotions. This subsection of the data analyses examined the hypothesis (2.5) that the levels of pleasant somatic emotions would be greater for the low-conflict group than the high-conflict group. Table 34 presents

mean scores and standard deviations of relaxation, excitement, placidity and provocativeness for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on the pleasant somatic emotions is displayed in Table 35.

For relaxation, the ANOVA yielded no main effects. A significant time x topic interaction was found. To interpret the interaction, t-tests were performed and showed that relaxation decreased significantly only from before to after the conflictual conversation (M_{pre} = 5.35, SD = 1.26; M_{post} = 4.60, SD =1.34), t (23) = 3.30, p = .003, and postconversation relaxation was significantly lower for the conflictual conversation (M = 4.60, SD = 1.34) than the neutral (M = 5.42, SD = 1.35), t (23) = 3.16, p = .004, or pleasant conversation (M = 5.23, SD = 1.29), t (23) = -2.72, p = .012.

For excitement, the ANOVA yielded main effects for time but not for mother/daughter, topic or conflict. There was a significant mother/daughter x conflict interaction (Figure 15). Excitement increased significantly from before to after the conversations (M_{post} = 2.69, SD = 0.82; M_{pre} = 2.29, SD = 0.74). To interpret the mother/daughter x conflict interaction, t-tests were used and revealed that excitement did not differ for mothers in the low-conflict and high-conflict groups; but for daughters, excitement was significantly greater in the high-conflict group (M = 3.18, SD = 1.11) than in the low-conflict group (M = 1.89, SD = 0.69), t (22) = -3.42, p = .003; also, mothers in the low-conflict group experienced significantly greater levels of excitement than did their daughters (M = 2.60, SD = 0.86; M = 1.89, SD = 0.69), t (11) = 3.09, p = .010.

Table 33. *Mean Scores and Standard Deviations of TESI Tension and Effort Stress due to Body and External Factors for Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
TESI Tension and Effort Stress		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
Tension Stress : External Factors	-Before	2.33	1.72	1.92	1.51	1.92	1.38	2.08	1.51	2.33	1.61	1.75	1.14
	-After	2.17	1.64	2.00	1.48	2.00	1.48	2.25	1.36	2.00	1.65	1.83	1.53
Tension Stress : Body	-Before	2.25	1.29	1.83	1.75	2.08	1.24	1.83	1.59	2.00	1.54	1.75	1.22
	-After	2.17	1.34	1.83	1.75	1.83	1.27	2.00	1.41	1.92	1.24	1.67	1.44
Effort Stress : External Factors	-Before	2.50	1.93	1.83	1.40	2.33	2.02	1.92	1.24	2.75	1.96	1.50	1.00
	-After	2.50	2.07	1.83	1.40	2.33	1.92	1.92	1.00	2.33	1.87	1.58	1.24
Effort Stress : Body	-Before	2.42	1.83	1.67	1.72	2.25	1.86	1.42	1.16	2.42	1.88	1.67	1.72
	-After	2.50	1.93	1.75	1.71	2.17	1.90	1.83	1.19	2.33	1.92	1.67	1.72
High-conflict Group													
Tension Stress : External Factors	-Before	2.67	1.50	3.08	2.07	2.17	1.47	2.50	1.57	2.25	1.71	3.08	1.73
	-After	2.67	1.67	3.08	2.07	2.67	1.15	3.25	2.09	2.25	1.48	3.50	2.11
Tension Stress : Body	-Before	2.17	1.27	2.83	1.40	2.08	1.16	2.17	1.11	2.08	1.16	2.75	1.22
	-After	2.58	1.62	2.83	2.04	2.67	0.98	2.75	1.42	2.08	1.16	2.92	1.83
Effort Stress : External Factors	-Before	2.92	1.68	3.58	2.11	2.25	1.48	2.42	1.51	2.58	1.98	3.33	1.78
	-After	2.67	1.67	3.33	2.06	2.75	1.42	3.67	2.02	2.42	1.62	3.50	2.11
Effort Stress : Body	-Before	2.33	1.23	3.00	1.76	2.17	1.19	2.67	1.78	2.33	1.44	2.92	1.44
	-After	2.67	1.56	3.33	2.02	2.67	1.37	2.75	1.54	2.25	1.48	3.00	1.65

Note. N = 24 dyads.

Table 34. *Mean Scores and Standard Deviations of Pleasant Somatic TESI Emotions (Relaxation, Excitement, Placidity, and Provocativeness) for Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After Listening to each Conversation Topic (N = 24 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Pleasant Somatic TESI Emotions		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
Relaxation	-Before	5.58	1.65	5.50	1.62	5.75	1.22	4.58	2.39	5.25	1.36	5.42	1.83
	-After	6.00	1.21	5.08	2.19	4.92	1.16	4.25	2.01	5.17	1.75	5.17	2.08
Excitement	-Before	2.25	1.14	1.50	0.67	2.42	1.24	2.17	1.40	2.25	1.36	1.67	0.98
	-After	2.58	1.51	1.75	0.87	2.75	1.42	2.00	1.35	3.33	1.37	2.25	1.06
Placidity	-Before	4.25	1.76	4.75	1.66	4.00	1.95	4.75	1.96	3.92	1.78	5.00	1.54
	-After	3.50	1.68	4.33	2.31	3.50	1.83	3.17	1.90	4.58	1.44	4.08	2.35
Provocativeness	-Before	1.33	0.89	1.17	0.58	1.33	0.89	1.08	0.29	1.33	0.89	1.33	0.89
	-After	1.33	0.89	1.17	0.58	1.58	0.90	1.75	1.06	1.50	1.17	1.50	1.00
High-conflict Group													
Relaxation	-Before	5.00	1.95	4.50	1.98	5.42	1.51	5.67	1.37	5.58	1.31	4.92	1.73
	-After	5.50	1.38	5.08	1.88	4.92	1.24	4.33	1.87	5.08	1.38	5.50	1.57
Excitement	-Before	2.17	1.34	3.17	1.70	2.33	1.30	3.00	1.65	1.83	0.94	2.75	1.42
	-After	2.33	1.30	2.92	1.62	2.42	1.38	3.58	1.38	2.75	0.87	3.67	2.10
Placidity	-Before	4.83	1.40	3.75	1.60	4.75	1.86	4.00	1.48	4.75	1.48	3.92	1.62
	-After	4.67	1.50	4.17	1.40	3.17	1.47	3.50	1.62	4.67	1.61	4.25	1.48
Provocativeness	-Before	1.17	0.39	2.33	1.44	1.17	0.58	2.42	1.93	1.08	0.29	2.25	1.91
	-After	1.00	0.01	2.75	1.82	1.75	0.97	3.58	1.93	1.75	1.60	2.50	2.02

Table 35. *Significant Main Effects and Interactions for the ANOVAs on Relaxation, Excitement, Placidity and Provocativeness for Mothers and Daughters in the Low-conflict and High-conflict Groups*

Pleasant Somatic TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Relaxation	Time x Topic	5.63	1.84, 40.44	.008
Excitement	Time	7.95	1, 22	.010
	Mother/Daughter x Conflict	11.19	1, 22	.003
Placidity	Time	10.28	1, 22	.004
	Time x Topic	7.13	1.99, 43.73	.002
	Mother/Daughter x Time x Conflict	5.91	1, 22	.024
Provocativeness	Mother/Daughter	5.51	1, 22	.028
	Time	18.31	1, 22	< .001
	Time x Topic	6.57	1.60, 35.28	.006
	Mother/Daughter x Conflict	6.80	1, 22	.016

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 24 dyads.

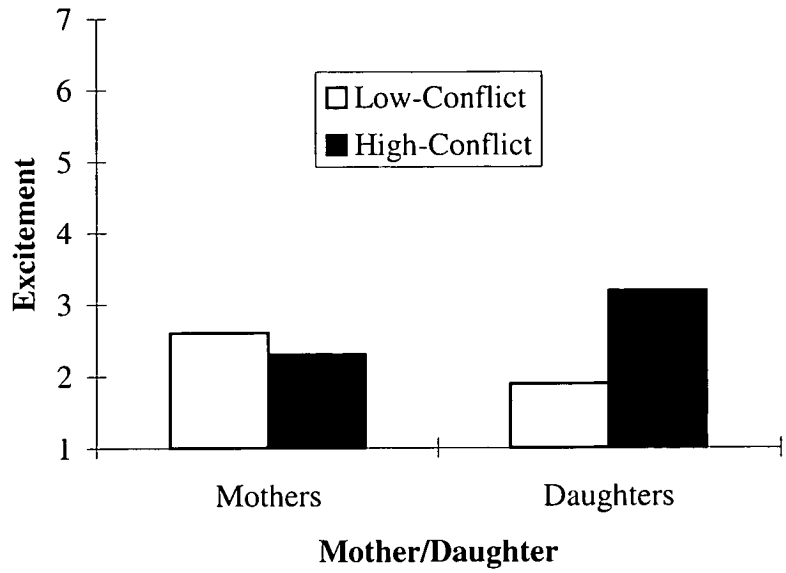

Figure 15. Mean scores of Excitement for Mothers and Daughters in the Low-Conflict and High-Conflict groups.

For placidity, the ANOVA yielded a main effect for time and topic but not for mother/daughter or conflict. There was a significant time x topic interaction. Placidity decreased significantly from before to after the conversations (M_{pre} = 4.39, SD = 1.09; M_{post} = 3.97, SD = 1.27). t-tests revealed that placidity was significantly lower for the conflictual conversation (M = 3.85, SD = 1.19) than for the neutral (M = 4.26, SD = 1.30), t (23) = 2.24, p = .035, or pleasant conversation (M = 4.40, SD = 1.24), t (23) = -2.69; p = .013. To interpret the time x topic interaction, t-tests were performed and indicated that placidity decreased significantly from before to after the conflictual conversation (M_{pre} = 4.38, SD = 1.30; M_{post} = 3.33, SD = 1.31), t (23) = 4.85, $p < .001$, and that postconversation placidity was significantly lower for the conflictual conversation (M = 3.33, SD = 1.31) than the neutral (M = 4.17, SD = 1.54), t (23) = -3.29, p = .003, or pleasant conversation (M = 4.40, SD = 1.41), t (23) = -4.02, p = .001.

The ANOVA on provocativeness produced a main effect for mother/daughter and time but not for topic or conflict. The difference in provocativeness between the low-conflict group (M = 1.37, SD = 0.42) and high-conflict group was a non-significant trend, F (1, 22) = 3.97, p = .059. There were significant interactions for mother/daughter x conflict (Figure 16) and time x topic. Provocativeness increased significantly from before to after the conversations (M_{pre} = 1.50, SD = 0.71; M_{post} = 1.85, SD = 0.93). Daughters experienced significantly greater levels of provocativeness (M = 1.76, SD = 1.30) than did mothers (M = 1.24, SD = 0.59). To examine the mother/daughter x conflict interaction, t-tests were performed and showed that daughters in the high-conflict group experienced significantly greater provocativeness (M = 2.64, SD = 1.67) than did daughters in the low-conflict group (M = 1.33, SD = 0.53), t (22) = -2.58, p = .022, and in the high-conflict group, daughters felt greater level of provocativeness than did their mothers (M = 2.64, SD = 1.67; M = 1.32, SD = 0.45), t (11) = -3.10, p = .010. For the time x topic interaction, t-tests showed that provocativeness increased significantly from before to after listening to the conflictual conversation (M_{pre} = 1.50, SD = 0.81; M_{post} = 2.17, SD = 1.04), t (23) = -5.27, $p < .001$, and postconversation provocativeness was significantly greater for the conflictual conversation (M = 2.17, SD = 1.04) than the neutral conversation (M = 1.56, SD = 0.78), t (23) = -3.73, p = .001.

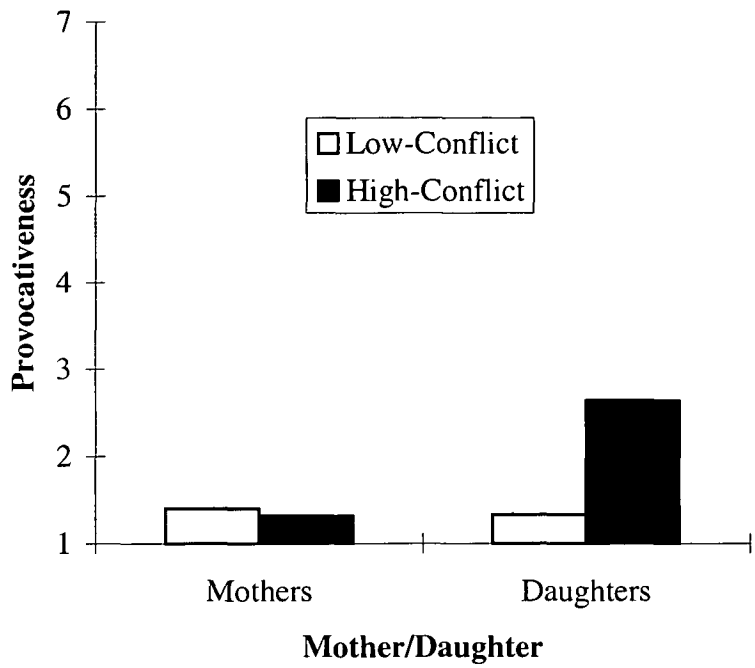

Figure 16. Means Scores of Provocativeness for Mothers and Daughters in the Low-Conflict and High-Conflict Groups.

Summary. This subsection of the data analyses did not support the hypothesis (2.5) that the levels of pleasant somatic emotions would be greater for the low-conflict group than the high-conflict group. Also, the levels of excitement and provocativeness were greater for daughters in the high-conflict group than those in the low-conflict group. These findings were opposite to the hypothesis that daughters in the high-conflict group would experience greater levels of unpleasant somatic emotions than daughters in the low-conflict group. Furthermore, in the low-conflict group, excitement was greater for mothers than their daughters. This part of data provided additional information in that the levels of excitement and provocativeness increased while the level of relaxation decreased from before to after the conversations. Among the three conversation topics, the conflictual conversation produced the lowest levels of relaxation and placidity and highest level of

provocativeness. The findings on relaxation and placidity provided partial support for the hypothesis of Experiment 1 (1.9) that the levels of pleasant somatic emotions would be greater during the pleasant conversation than the conflictual or neutral conversation. However, the data regarding provocativeness contradicted this hypothesis. There were reductions in the levels of relaxation and placidity and increase in the level of provocativeness from before to after the conflictual conversation. The impacts of this conversation on reducing the levels of relaxation and placidity supported the hypothesis of Experiment 1 (1.6) that the conflictual conversation would reduce the levels of pleasant somatic emotions for mothers and daughters. However, the effect of the conflictual conversation on increasing the level of provocativeness was opposite to the hypothesis. Daughters experienced greater levels of provocativeness than did mothers.

The unpleasant somatic emotions. This subsection of the data analyses explored the hypotheses that the levels of unpleasant somatic emotions would be greater for the high-conflict group than the low-conflict group (2.4), and the levels of these emotions would be greater for daughters in the high-conflict group than those in the low-conflict group (2.3). Table 36 displays mean scores and standard deviations of anxiety, boredom, anger and sullenness for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for these ANOVAs is presented in Table 37.

The ANOVAs on anxiety and boredom did not yield any significant main effects or interactions.

Table 36. *Mean Scores and Standard Deviations of Unpleasant Somatic TESI Emotions (Anxiety, Boredom, Anger, and Sullenness) for Mothers and Daughters in the Low-Conflict and High-conflict Groups Before and After Listening to each Conversation Topic*

	Neutral Topic				Conflictual Topic				Pleasant Topic			
	Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Unpleasant Somatic TESI Emotions	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict group												
Anxiety -Before	1.58	0.79	1.83	1.64	1.83	1.11	2.17	1.85	1.67	0.98	2.08	1.44
-After	1.50	0.67	2.00	1.95	1.75	0.75	2.50	1.24	1.42	0.90	2.08	1.68
Boredom -Before	2.00	1.28	2.75	2.30	2.08	1.38	2.67	2.23	1.67	0.98	2.58	2.15
-After	1.83	1.19	2.33	1.83	2.25	1.42	2.25	1.60	1.83	1.34	2.00	1.71
Anger -Before	1.08	0.29	1.25	0.87	1.08	0.29	1.08	0.29	1.17	0.58	1.17	0.39
-After	1.08	0.29	1.17	0.39	1.50	0.90	1.75	1.22	1.08	0.29	1.33	0.89
Sullenness -Before	1.08	0.29	1.58	1.44	1.08	0.29	1.58	1.16	1.33	0.89	1.17	0.39
-After	1.08	0.29	1.75	1.42	1.25	0.45	1.50	0.80	1.08	0.29	1.08	0.29
High-conflict Group												
Anxiety -Before	2.33	1.61	2.58	1.98	1.75	1.06	1.83	0.94	2.17	1.40	2.08	1.38
-After	2.17	1.95	2.17	1.64	2.75	1.22	2.83	2.04	2.00	1.48	2.50	1.98
Boredom -Before	2.75	2.14	2.58	1.88	2.83	2.33	2.83	1.89	2.42	2.07	2.83	1.85
-After	2.75	1.96	2.67	1.15	3.33	2.93	3.17	1.27	2.17	1.75	3.08	2.43
Anger -Before	1.08	0.29	2.33	2.06	1.42	1.00	2.00	1.95	1.08	0.29	2.08	1.93
-After	1.00	0.01	2.25	1.91	2.33	1.56	3.17	2.12	1.17	0.58	2.25	2.09
Sullenness -Before	1.75	1.22	2.42	1.83	1.25	0.45	2.33	1.87	1.17	0.39	2.17	1.80
-After	1.08	0.29	2.08	1.78	1.67	1.07	3.58	1.93	1.50	1.45	2.17	1.80

Note. N =24 dyads.

Table 37. *Signficant Main Effects and Interactions for the ANOVAs on Anxiety, Boredom, Anger and Sullrnness for Mothers and Daughters in the Low-conflict and High-conflict Groups*

Unpleasant Somatic TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Anxiety	Nil			
Boredom	Nil			
Anger	Mother/Daughter	4.49	1, 22	.046
	Time	13.31	1, 22	.001
	Topic	12.48	1.20, 26.48	.001
	Time x Topic	11.20	1.49, 32.84	.001
Sullenness	Conflict	4.70	1, 22	.041
	Mother/Daughter	7.10	1, 22	.014
	Topic	3.54	1.93, 42.53	.039
	Mother/Daughter x Topic	3.60	1.86, 40.86	.039
	Time x Topic	3.86	1.79, 39.32	.034
	Time x Topic x Conflict	4.35	1.79, 39.32	.023

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 24 dyads.

The ANOVA on anger yielded a main effect for mother/daughter, time and topic but not for conflict. A significant time x topic interaction was found. Daughters experienced significantly greater anger (M = 1.82, SD = 1.44) than did mothers (M = 1.26, SD = 0.38). Anger increased significantly from before to after the conversations (M_{pre} = 1.40, SD = 0.77; M_{post} = 1.67, SD = 0.89). t-tests revealed that anger was significantly greater for the conflictual conversation (M = 1.79, SD = 0.93) than the neutral (M = 1.41, SD = 0.80), t (23) = -3.66, p = .001, or pleasant conversation (M = 1.42, SD = 0.83), t (23) = 3.30, p = .003. To interpret the time x topic interaction, t-tests showed that anger increased significantly from before to after the conflictual conversation (M_{pre} = 1.40, SD = 0.79; M_{post} = 2.19, SD = 1.27), t (23) = -3.80, p = .001, and postconversation anger was significantly greater for the conflictual conversation (M = 2.19, SD = 1.27) than the neutral (M = 1.38 , SD = 0.73), t (23) = -4.18, $p < .001$ or pleasant conversation (M = 1.46, SD = 0.97), t (23) = 3.53, p = .002.

The ANOVA on sullenness yielded main effects for conflict, mother/daughter and topic but not for time. There were significant interactions for mother/daughter x topic (Figure 17), time x topic, and time x topic x conflict (Figure 18). The high-conflict group experienced significantly greater level of sullenness than did the low-conflict group (M = 1.93, SD = 0.95; M = 1.30, SD = 0.33). Daughters experienced significantly greater sullenness (M = 1.95, SD = 1.35) than did mothers (M = 1.28, SD = 0.42). For topic, t-tests revealed that the only significant difference in anger was between the conflictual conversation (M = 1.78, SD = 0.86) and the pleasant conversation (M = 1.46, SD = 0.89), t (23) = 2.50, p = .020. To examine the time x topic and mother/daughter x topic interactions t-tests were used. For the time x topic interaction, the t-tests indicated sullenness increased

significantly from before to after the conflictual conversation (M_{post} = 2.00, SD = 1.09; M_{pre} = 1.56, SD = 0.80), t (23) = -2.56, p = .018, and that postconversation sullenness was significantly greater for the conflictual conversation (M = 2.00, SD = 1.10) than the neutral (M = 1.50, SD = 0.79), t (23) = -2.73, p = .026, or pleasant conversation (M = 1.46, SD = 1.15), t (23) = 2.69, p = .013. For the mother/daughter x topic interaction, the t-tests showed that sullenness of daughters was significantly greater for the conflictual conversation (M = 2.25, SD = 1.53) than the pleasant conversation (M = 1.65, SD = 1.29), t (23) = 3.80, p = .001. To examine the time x topic x conflict interaction, separate 2(Time: Before/After) x 2 (Conflict: Low-conflict/High-conflict) ANOVAs were conducted for each topic. The ANOVAs on the neutral and pleasant conversations did not yield any significant main effects or interaction. For the conflictual conversation, there was a main effect for time, F (1, 22) = 8.15, p = .009, with more sullenness after the conflictual conversation than before (mean differences mentioned earlier) and for conflict, F (1, 22) = 7.61, p = .011; also, there was a significant time x conflict interaction, F (1, 22) = 6.67, p = .017. During the conflictual conversation, sullenness was greater for the high-conflict group (M = 2.21, SD = 0.99) than the low-conflict group (M = 1.35, SD = 0.42); and for the conflictual conversation, the high-conflict group experienced significantly greater level of postconversation sullenness (M = 2.63, SD = 1.17) than did the low-conflict group (M = 1.38, SD = 0.53), t (22) = -3.37, p = .003; also, for the high-conflict group, sullenness increased significantly from before to after listening to the conflictual conversation (M_{pre} = 1.79, SD = 0.94, M_{post} = 2.63, SD = 1.17), t (11) = -3.71, p = .003.

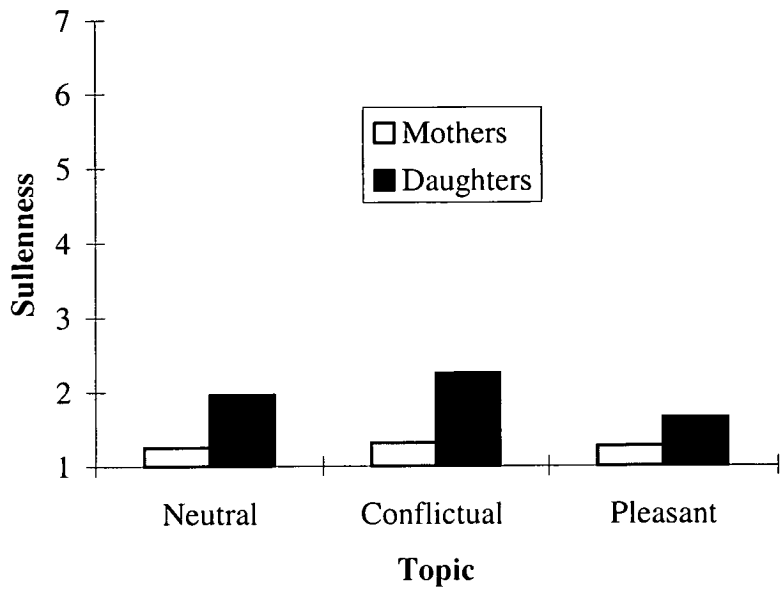

Figure 17. Mean scores of Sullenness for Mothers and Daughters for each Conversation Topic.

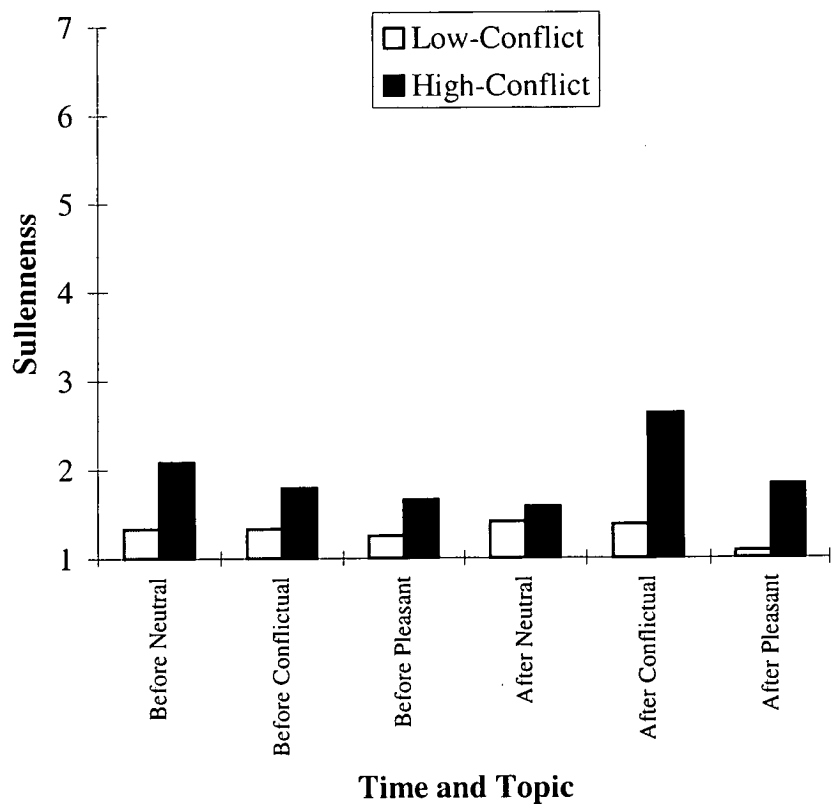

Figure 18. Mean scores of Sullenness for the Low-Conflict and High-Conflict Groups Before and After each Conversation Topic.

Summary. This portion of the data analyses provided partial support for the prediction that the levels of unpleasant somatic emotions would be greater for the high-conflict group than the low-conflict group (2.4). However, the findings did not yield mother/daughter x conflict interactions which could indicate that this difference was specifically evident between daughters in the two groups (2.3). The ANOVAs on anxiety and boredom did not yield any main effects or significant interactions. A significant effect for conflict occurred for the ANOVA for sullenness and not for anger. The group differences in sullenness were consistent with the hypothesis regarding greater levels of unpleasant somatic emotions for the high-conflict group than the other group. The results of this subsection also provided additional information in that, during the conflictual conversation, the high-conflict group experienced significantly greater level of sullenness than did the low-conflict group. For the high-conflict group, the level of sullenness increased significantly from before to after the conflictual conversation. The levels of anger and sullenness was greater for daughters than for mothers. The findings of this section provided partial support for the hypotheses of Experiment 1 that the conflictual conversation would increase the levels of unpleasant somatic emotions for the participants (1.6), and that the levels of unpleasant somatic emotions would be greater for the conflictual conversation than the other two conversations (1.8). The conflictual conversation increased the levels of anger and sullenness for mothers and daughters. Among the three conversation topics, the conflictual conversation produced the highest levels of anger for mothers and daughters and highest levels of sullenness for daughters.

The pleasant transactional emotions. This portion of the data analyses tested the hypothesis that the levels of pleasant transactional emotions would be greater for the low-conflict group than the high-conflict group (2.5). Table 38 presents mean scores and standard deviations of pride, modesty, gratitude and virtue for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on these emotions is displayed in Table 39.

The ANOVA on pride yielded a main effect for conflict and for mother/daughter but not for time or topic. There were no significant interactions. The high-conflict group experienced significantly greater level of pride (M = 3.42, SD = 1.03) than did the low-conflict group (M = 2.45, SD = 1.01). Pride was significantly greater for mothers (M = 3.33, SD = 1.60) than for daughters (M = 2.54, SD = 1.25).

For modesty, the ANOVA yielded a main effect for mother/daughter but not for time, topic or conflict. A significant mother/daughter x time interaction was found and means are graphed in Figure 19. Modesty was significantly greater for mothers (M = 3.35, SD = 1.63) than for daughters (M = 2.44, SD = 0.94). To interpret the mother/daughter x time interaction, t-tests were used and revealed that post-conversation modesty was significantly greater for mothers (M = 3.38, SD = 1.50) than daughters (M = 2.22, SD = 0.96), t (23) = 3.51, p = .002, and, for daughters, modesty decreased significantly from before to after the conversations (M_{pre} = 2.65, SD = 1.02; M_{post} = 2.22, SD = 0.96), t (23) = 3.55, p = .002.

Table 38. *Mean Scores and Standard Deviations of Pleasant Transactional TESI Emotions (Pride, Modesty, Gratitude, and Virtue) for For Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After each Conversation Topic*

	Neutral Topic				Conflictual Topic				Pleasant Topic			
	Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Pleasant Transactional TESI Emotions	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group												
Pride -Before	2.50	1.57	1.92	1.38	2.58	1.51	2.17	1.64	2.50	1.38	2.00	1.48
-After	3.00	1.35	1.75	1.29	3.25	1.60	2.17	1.53	3.25	1.60	2.33	1.87
Modesty -Before	3.00	1.76	2.17	1.11	3.08	1.62	2.25	1.29	3.00	1.81	2.17	1.34
-After	2.92	1.62	1.83	0.94	3.08	1.51	1.75	1.22	3.42	1.73	2.00	1.41
Gratitude -Before	2.25	1.86	1.67	0.98	2.17	1.75	1.92	1.31	2.50	1.57	2.17	1.27
-After	2.33	1.72	1.58	1.00	2.42	1.56	1.50	0.90	3.08	2.15	2.08	1.31
Virtue -Before	2.75	1.60	2.00	1.21	2.92	1.62	1.75	0.97	2.75	1.66	2.58	1.24
-After	2.58	1.62	2.17	1.47	3.25	1.76	2.08	1.16	2.92	1.44	2.00	1.35
High-conflict Group												
Pride -Before	3.58	2.27	2.75	1.42	3.83	2.17	3.50	1.45	3.67	2.23	2.83	1.03
-After	3.83	2.21	3.08	1.44	4.08	1.78	3.00	1.54	3.92	2.11	3.00	1.48
Modesty -Before	3.75	2.09	3.33	1.37	3.83	2.33	3.00	1.35	3.25	2.30	3.00	1.48
-After	4.00	2.00	2.83	1.03	3.25	1.82	2.58	1.38	3.58	2.11	2.33	1.30
Gratitude -Before	3.25	1.82	3.75	1.82	3.58	1.62	3.83	1.34	3.42	1.78	3.33	1.30
-After	4.17	1.64	3.17	1.53	3.50	1.93	3.58	1.56	4.25	1.36	4.08	1.88
Virtue -Before	3.33	2.31	3.17	1.11	3.33	2.39	3.33	1.37	3.50	2.54	3.33	0.98
-After	3.17	2.48	3.50	1.57	3.08	2.35	2.83	1.19	3.58	2.35	3.00	1.04

Note. N = 24 dyads.

Table 39. *Significant Main Effects and Interactions for the ANOVAs on Pride, Modesty, Gratitude and Virtue for Mothers and Daughters in the Low-conflict and High-conflict Groups*

Pleasant Transactional TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Pride	Conflict	5.43	1, 22	.029
	Mother/Daughter	4.44	1, 22	.047
Modesty	Mother/Daughter	6.91	1, 22	.015
	Mother/Daughter x Time	6.78	1, 22	.016
Gratitude	Conflict	21.12	1, 22	< .001
	Topic	3.54	1.96, 43.15	.039
Virtue	Conflict	4.39	1, 22	.048

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 24 dyads.

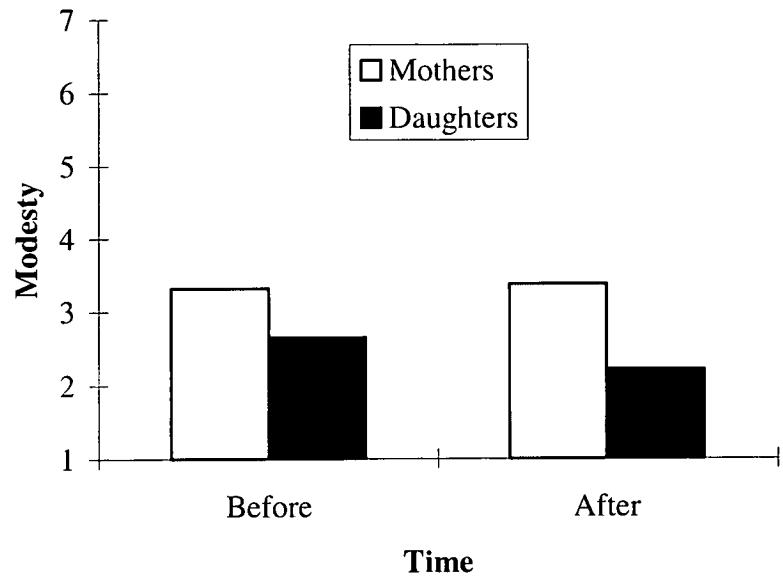

Figure 19. Mean scores of Modesty for Mothers and Daughters Before and After Listening to Conversations.

The ANOVA on gratitude yielded a main effect for conflict and topic but not for mother/daughter or time. There were no significant interactions. The high-conflict group experienced significantly higher level of gratitude (M = 3.66, SD = 0.78) than did the low-conflict group (M = 2.14, SD = 0.84). t-tests revealed that gratitude was significantly greater for the pleasant conversation (M = 3.11, SD = 1.15) than the neutral (M = 2.77, SD = 1.24), t (23) = -2.33, p = .029, or conflictual conversation (M = 2.81, SD = 1.14), t (23) = -2.28, p = .032.

For virtue, the ANOVA produced a main effect for conflict but not for mother/daughter, time and topic. There were no significant interactions. The high-conflict group felt significantly greater virtue (M = 3.27, SD = 1.12) than did the low-conflict group (M = 2.48, SD = 0.65).

Summary. This subsection of the data analyses did not support the hypothesis (2.5) regarding differences in pleasant transactional emotions between the low-conflict and high-conflict groups. Significant main effects for conflict occurred for the ANOVAs on pride, gratitude and virtue. However, the group differences were opposite to those hypothesized. The high-conflict group experienced greater levels of pride, gratitude and virtue than did the low-conflict group. This portion of the findings provided additional information in that the levels of pride and modesty were significantly greater for mothers than daughters. For daughters, modesty decreased from before to after the conversations. The pleasant conversation induced greater level of gratitude than did the conflictual conversation. This outcome provided partial support for the hypothesis of Experiment 1 (1.9) that the levels of pleasant transactional emotions would be greater during the pleasant conversation than the other two conversations.

The unpleasant transactional emotions. This subsection of the data analyses examined the hypotheses that the levels of unpleasant transactional emotions would be greater for the high-conflict group than the low-conflict group (2.4), and the levels of these emotions would be greater for daughters in the high-conflict group than those in the low-conflict group (2.3). Table 40 displays mean scores and standard deviations of humiliation, shame, resentment and guilt for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on these emotions is presented in Table 41.

Table 40. *Mean Scores and Standard Deviations of Unpleasant Transactional TESI Emotions (Humiliation, Shame, Resentment, and Guilt) for Mothers and Daughters in the Low-conflict and High-conflict Groups Before and After each Conversation Topic (N = 24 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Unpleasant Transactional TESI Emotions		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
Humiliation	-Before	1.08	0.29	1.08	0.29	1.08	0.29	1.17	0.39	1.08	0.29	1.17	0.58
	-After	1.08	0.29	1.75	1.60	1.33	0.65	1.58	1.24	1.08	0.29	1.42	1.16
Shame	-Before	1.08	0.29	1.25	0.87	1.08	0.29	1.08	0.29	1.08	0.29	1.42	1.00
	-After	1.08	0.29	1.33	0.89	1.33	0.49	1.75	1.22	1.08	0.29	1.08	0.29
Resentment	-Before	1.17	0.39	1.17	0.39	1.17	0.39	1.08	0.29	1.08	0.29	1.42	0.90
	-After	1.17	0.39	1.58	1.44	1.25	0.45	1.75	0.87	1.08	0.29	1.33	0.89
Guilt	-Before	1.17	0.39	1.08	0.29	1.25	0.45	1.25	0.62	1.08	0.29	1.33	1.15
	-After	1.17	0.39	1.08	0.29	1.58	0.67	1.33	0.65	1.17	0.39	1.08	0.29
High-conflict Group													
Humiliation	-Before	1.33	0.65	1.83	1.70	1.17	0.39	2.17	1.80	1.17	0.39	1.67	1.23
	-After	1.50	1.00	2.92	2.15	1.58	1.16	3.00	2.26	1.92	1.83	2.08	1.83
Shame	-Before	1.08	0.29	1.58	1.73	1.08	0.29	2.08	1.38	1.00	0.01	1.42	0.90
	-After	1.08	0.29	1.58	1.24	1.67	0.89	2.67	1.44	1.17	0.39	1.33	0.65
Resentment	-Before	1.33	0.65	2.00	1.76	1.50	1.24	2.42	2.07	1.17	0.39	2.08	1.98
	-After	1.17	0.39	2.42	2.15	1.83	0.94	3.50	2.24	1.50	1.17	3.00	2.26
Guilt	-Before	1.50	1.17	1.92	1.78	1.58	1.16	1.42	0.67	1.42	1.44	1.33	0.65
	-After	1.33	0.89	1.67	0.78	1.50	0.80	2.08	1.31	1.58	1.51	1.58	0.79

Table 41. *Significant Main Effects and Interactions for the ANOVAs on Humiliation, Shame, Resentment and Guilt for Mothers and Daughters in the Low-conflict and High-conflict Groups*

Unpleasant Transactional TESI Emotions	Significant Main Effects and Interactions	*F*	df	*p*
Humiliation	Conflict	5.90	1, 22	.024
	Mother/Daughter	5.44	1, 22	.029
	Time	15.19	1, 22	.001
Shame	Mother/Daughter	8.08	1, 22	.009
	Time	6.15	1, 22	.021
	Topic	9.88	1.95, 42.80	<.001
	Topic x Conflict	3.91	1.95, 42.80	.280
	Time x Topic	4.17	1.48, 32.55	.035
Resentment	Conflict	7.18	1, 22	.014
	Mother/Daughter	5.35	1, 22	.030
	Time	9.11	1, 22	.006
	Mother/Daughter x Time	4.53	1, 22	.045
Guilt	Nil			

Notes. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 24 dyads.

For the ANOVA on humiliation, main effects occurred for conflict, mother/daughter and time but not for topic. There were no significant interactions. The high-conflict group experienced significantly greater humiliation (M = 1.86, SD = 0.77) than did the low-conflict group (M = 1.24, SD = 0.42). Daughters felt significantly greater humiliation (M = 1.82, SD = 1.15) than did mothers (M = 1.28, SD = 0.52). Humiliation increased significantly from before to after the conversations (M_{pre} = 1.33, SD = 0.48; M_{post} = 1.77, SD = 0.93).

For shame, the ANOVA produced a main effect occurred for mother/daughter, time, and topic but not for conflict. There were significant interactions for topic x conflict, (Figure 20), and time x topic. Daughters felt significantly higher levels of shame (M = 1.55, SD = 0.68) than did mothers, (M = 1.15, SD = 0.24). Shame increased significantly from before to after the conversations (M_{post} = 1.43, SD = 0.44; M_{pre} = 1.27, SD = 0.36). For topic, t-tests revealed that shame was significantly greater for the conflictual conversation (M = 1.59, SD = 0.57) than for the neutral (M = 1.26, SD = 0.48), t (23) = -3.47, p = .002, or pleasant conversation (M = 1.20, SD = 0.32; M = 1.20, SD = 0.32), t (23) = 3.55, p = .002. With respect to the time x topic interaction, t-tests showed that shame did not differ significantly before and after the neutral or pleasant conversation topic; but shame increased significantly from before to after the conflictual conversation (M_{pre} = 1.33, SD = 0.56; M_{post} = 1.85, SD = 0.76), t (23) = -3.65, p = .001, and also postconversation shame was significantly greater for the conflictual conversation than the neutral (M = 1.27, SD = 0.61), t (23) = -3.98, p = .001, or pleasant conversation (M = 1.17, SD = 0.28), t (23) = 5.01, $p < .001$. For the topic x conflict interaction, the t-tests showed that for the conflictual conversation, the high-conflict group experienced greater level of shame (M = 1.88, SD = 0.60) than did the low-

conflict group (M = 1.31, SD = 0.43), t (20.43) = -2.74, p = .013; also, for the high-conflict group, shame was significantly greater for the conflictual conversation (M = 1.88, SD = 0.57) than for the neutral (M = 1.33, SD = 0.53), t (11) = -3.68, p = .004, or pleasant conversation (M = 1.23, SD = 0.34), t (11) = 3.87, p = .003.

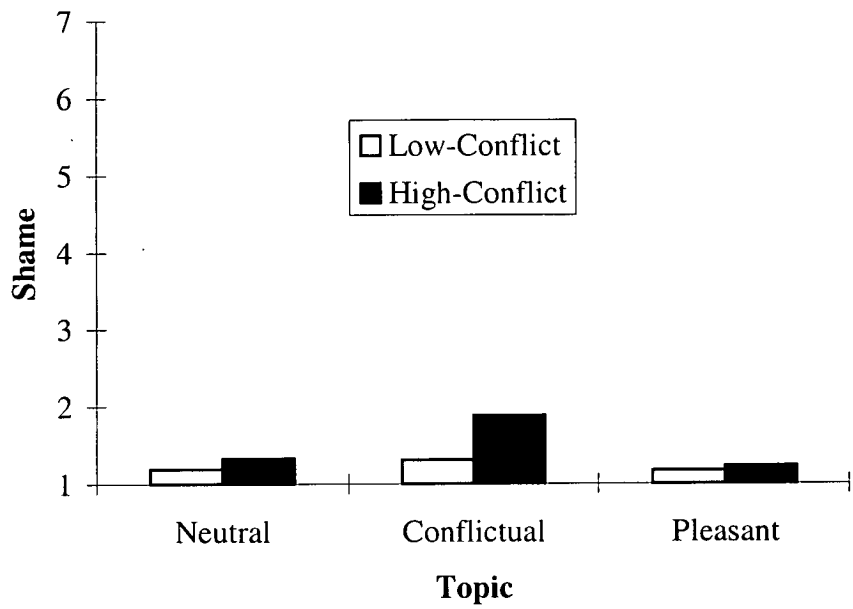

Figure 20. Mean Scores of Shame for each Topic for the Low-Conflict and High-Conflict Groups.

The ANOVA on resentment yielded main effects for conflict, mother/daughter and time but not for topic. Although, resentment was greater for the conflictual conversation topic (M = 1.81, SD = 0.93) than for the neutral (M = 1.50, SD = 0.74) or pleasant conversation (M = 1.58, SD = 0.80), the main effect for topic failed to reach significance, F (1.73, 38.05) = 3.32, p = .053. A significant mother/daughter x time interaction was found, and means are graphed in Figure 21. Resentment was significantly greater for the high-conflict group (M = 1.99, SD = 0.87) than the low-conflict group (M = 1.27, SD = 0.34). Daughters experienced significantly greater resentment (M = 1.98, SD = 1.41) than did mothers (M = 1.28,

SD = 0.51). Resentment increased significantly from before to after the conversations (M_{pre} = 1.47, *SD* = 0.67; M_{post} = 1.80, *SD* = 0.90). To interpret the mother/daughter x time interaction, t-tests showed that post-conversation resentment was significantly greater for daughters (*M* = 2.26, *SD* = 1.70) than for mothers (*M* = 1.33, *SD* = 0.56), *t* (23) = -2.56, *p* = .018. Resentment for mothers and for daughters increased significantly from before to after the conversations (M_{pre} = 1.24, *SD* = 0.48; M_{post} = 1.33, *SD* = 0.56), *t* (23) = -2.07, *p* = .050; (M_{pre} = 1.69, SD = 1.29; M_{post} = 2.26, *SD* = 1.70), *t* (23) = -2.62, *p* = .015, respectively.

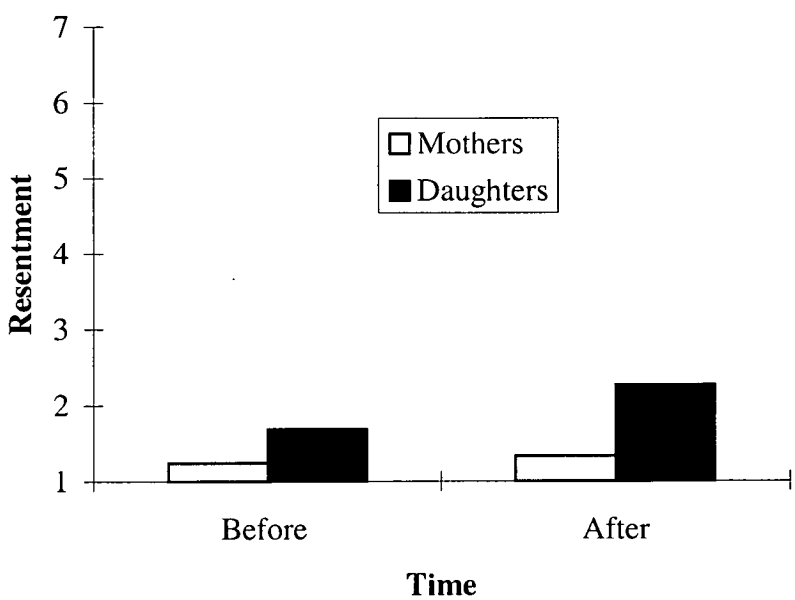

Figure 21. Mean Scores of Resentment for Mothers and Daughters Before and After Listening to each Conversation Topic.

The ANOVA on guilt did not yield any significant main effects or interactions. There was a non-significant trend regarding higher levels of guilt for the high-conflict group (*M* = 1.58, *SD* = 0.56) than the low-conflicted group (M = 1.22, SD = 0.23), *F* (1, 22) = 4.26, *p* = .051.

Summary. This portion of the data analyses did not support the hypothesis (2.3) that the levels of unpleasant transactional emotions would be greater for daughters in the high-conflict group than those in the low-conflict group. However, the findings provided partial support for the prediction (2.4) that the levels of these emotions would be greater for the high-conflict group than the low-conflict group. For humiliation, shame and resentment, the ANOVAs showed significant effects for conflict which were consistent with the hypothesis. The high-conflict group experienced significantly greater level of humiliation, resentment and shame than did the low-conflict group. For shame, this effect was observed during the conflictual conversation. The data provided additional information in that, for the high-conflict group, shame was significantly greater during the conflictual conversation than the neutral or pleasant conversation. The levels of humiliation, shame and resentment was greater for daughters than for mothers. Humiliation and resentment increased significantly from before to after the conversations. For shame, such increased was exclusive to the conflictual conversation. Among the three conversation topics, the conflictual conversation induced the highest level of shame for the participants. The findings regarding shame provided partial support for the hypotheses of Experiment 1 that the conflictual conversation would increase the levels of unpleasant transactional emotions for mothers and daughters (1.6), and the levels of unpleasant transactional emotions would be greater during the conflictual conversation than the other two conversations (1.8).

Psychophysiological Responses to the Neural, Conflictual and Pleasant Topics for the Low-conflict and High-conflict Groups

This subsection of the data analyses tested the hypotheses that physiological arousal would be greater for the conflictual conversation than the neutral or pleasant conversation (2.6), and that physiological arousal would be greater for the high-conflict dyads than the low-conflict dyads (2.7). For the ANOVAs on the physiological measures, the main effects for topic and conflict explored these hypotheses. The main effects for time and mother/daughter and the interactions provided additional information regarding the physiological responses of participants. Table 42 presents mean scores and standard deviations of Heart Rate (HR), Pulse Wave Transmission Time (PWTT), Skin Conductance Level (SCL), Respiration Rate (RESP), Respiratory Sinus Arrhythmia (RSA), and Finger Pulse Amplitude (FPA) percentage scores for mothers and daughters in the low-conflict and high-conflict groups before and after listening to each conversation topic. The list of significant main effects and interactions for the ANOVAs on these measures are displayed in Table 43.

For HR, there was no significant effects.

For Pulse Wave Transmission Time (PWTT), the ANOVA showed a main effect for mother/daughter but not for time, topic or conflict. There were no significant interactions. PWTT was significantly longer for mothers ($M = 0.41$, $SD = 0.04$) than for daughters ($M = 0.36$, $SD = 0.03$).

Table 42. *Mean Scores and Standard Deviations of HR, PWTT, SCL, RESP, RSA and FPA Percentage Scores for Mothers and Daughters in the Low-conflict and High-conflict Groups during the Baseline, Early and Late Periods of each Conversation Topic*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Physiological Measures		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
HR	-Baseline	69.87	7.68	71.74	11.43	70.70	9.44	71.56	10.20	69.47	5.79	70.21	8.08
	-Early Conversation	70.86	6.87	70.60	10.08	70.63	8.01	69.65	7.90	69.00	5.92	68.67	8.93
	-Late Conversation	69.88	7.27	71.06	9.94	71.53	8.18	73.06	11.64	71.23	7.81	70.21	8.92
PWTT	-Baseline	0.41	0.03	0.36	0.05	0.40	0.04	0.38	0.04	0.40	0.04	0.37	0.03
	-Early Conversation	0.41	0.03	0.35	0.02	0.42	0.04	0.37	0.05	0.40	0.04	0.37	0.03
	-Late Conversation	0.42	0.03	0.36	0.04	0.41	0.04	0.37	0.05	0.40	0.04	0.36	0.03
SCL	-Baseline	27.46	8.67	33.35	12.50	24.05	8.87	31.29	7.47	24.92	9.75	29.02	6.81
	-Early Conversation	30.04	10.11	31.49	7.15	27.54	12.63	30.99	6.95	26.71	12.21	34.08	11.49
	-Late Conversation	29.97	10.45	31.62	8.43	26.95	12.69	29.83	6.41	23.76	9.51	33.16	11.50
RESP	-Baseline	14.68	1.97	15.44	1.56	15.03	2.45	15.12	1.88	15.61	1.41	15.55	0.98
	-Early Conversation	15.67	1.92	16.67	2.19	16.17	2.25	16.92	2.61	16.42	2.47	15.93	0.90
	-Late Conversation	15.48	1.04	16.50	1.98	16.92	3.09	17.67	2.27	16.33	2.27	16.83	2.25
RSA	-Baseline	3.24	1.10	6.56	2.80	3.16	1.52	5.98	2.74	3.28	1.35	5.37	1.58
	-Early Conversation	3.57	1.61	5.60	2.68	2.73	1.03	5.18	2.23	3.46	0.70	6.42	2.98
	-Late Conversation	3.54	1.22	5.64	1.93	2.70	0.73	5.82	1.60	2.64	1.13	6.35	1.91
FPA	Percentage Score 1	111.64	45.23	100.47	17.00	101.53	32.26	89.63	16.41	93.95	28.18	93.42	35.87
	Percentage Score 2	110.15	39.75	105.82	21.98	100.64	30.92	91.85	35.64	100.54	47.72	88.02	27.98

Notes. FPA Percentage Scores 1 and 2 = These Scores are obtained be dividing the Early and Late Conversation FPA by Baseline FPA respectively, N = 24 dyads.

Table 42. Continued

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mothers		Daughters		Mothers		Daughters		Mothers		Daughters	
Physiological Measures		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
High-conflict Group													
HR	-Baseline	68.03	8.64	69.43	11.79	68.47	7.92	69.21	11.74	67.40	7.12	67.82	9.90
	-Early Conversation	68.74	6.99	70.38	11.30	67.33	5.97	68.61	10.85	67.40	7.52	67.99	12.05
	-Late Conversation	69.04	7.68	69.21	11.92	67.47	6.66	69.66	11.64	67.48	7.67	68.98	12.74
PWTT	-Baseline	0.42	0.06	0.37	0.05	0.42	0.06	0.37	0.04	0.42	0.06	0.36	0.03
	-Early Conversation	0.41	0.05	0.36	0.03	0.42	0.06	0.37	0.05	0.42	0.05	0.38	0.03
	-Late Conversation	0.41	0.04	0.36	0.03	0.42	0.05	0.36	0.04	0.42	0.05	0.37	0.03
SCL	-Baseline	21.15	7.96	25.99	9.42	24.28	9.28	27.51	10.69	22.67	8.14	27.52	10.25
	-Early Conversation	22.64	9.15	27.59	10.18	24.88	9.29	28.53	11.11	23.74	9.99	28.40	10.03
	-Late Conversation	22.06	8.23	27.42	10.32	24.25	8.74	27.70	10.43	23.42	9.16	28.11	10.27
RESP	-Baseline	15.00	1.54	14.58	2.71	15.08	1.88	15.08	2.71	14.73	1.35	15.00	1.71
	-Early Conversation	14.97	1.25	16.17	2.79	15.58	1.83	16.75	3.31	15.17	1.85	16.00	2.17
	-Late Conversation	15.52	0.69	16.00	1.95	15.80	1.78	17.26	2.09	15.51	1.51	15.83	1.85
RSA	-Baseline	2.64	0.97	6.59	3.32	2.87	0.96	8.15	4.00	3.06	0.67	5.87	2.01
	-Early Conversation	2.69	1.11	5.19	2.64	2.64	1.05	5.83	2.10	3.02	0.78	7.02	2.72
	-Late Conversation	2.40	0.98	5.70	2.14	2.34	0.85	5.37	2.10	2.74	1.08	6.91	2.51
FPA	Percentage Score 1	95.84	32.75	86.80	29.52	107.03	34.29	78.72	35.59	102.40	35.56	99.99	38.02
	Percentage Score 2	104.99	36.77	112.23	71.71	103.99	31.37	82.36	29.86	108.25	34.41	115.74	56.04

Notes. FPA Percentage Scores 1 and 2 = These Scores are obtained be dividing the Early and Late Conversation FPA by Baseline FPA respectively, N = 24 dyads.

Table 43. *Significant Main Effects and Interactions for the ANOVAs on HR, PWTT, SCL, RESP, RSA and Percentage FPA of Mothers and Daughters in the Low-conflict and High-conflict Groups*

Physiological Measures	Significant Main Effects and Interactions	*F*	df	*p*
HR	Nil			
PWTT	Mother/Daughter	21.32	1, 22	< .001
SCL	Mother/Daughter	7.09	1, 22	.014
	Time	10.36	1.86, 40.80	< .001
RESP	Time	29.12	1.62, 35.60	< .001
	Topic	3.55	1.86, 40.94	.041
RSA	Mother/Daughter	66.43	1, 22	< .001
	Time x Topic	3.60	3.03, 66.63	.018
% FPA	Time	6.45	1, 22	.019

Notes. degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures, N = 24 dyads.

The ANOVA on Skin Conductance Level (SCL) yielded a main effect for mother/daughter and time but not for topic or conflict. There were no significant interactions. SCL was significantly greater for daughters (M = 30.41, SD = 10.54) than mothers (M = 25.15, SD = 8.92). t-tests revealed that SCL increased significantly from the baseline period (M = 26.97, SD = 7.83) to the early conversation (M = 28.43, SD = 8.53), t (23) = -4.11, $p < .001$, and late conversation period (M = 27.93, SD = 8.30), t (23) = -2.79, p = .011. Furthermore, SCL decreased significantly from the early conversation to the late conversation period, t (23) = 2.12, p = .011.

The ANOVA on Respiration Rate (RESP) yielded a main effect for topic and time but not for mother/daughter or conflict. There were no significant interactions. t-tests indicated that RESP was significantly faster for the late conversation period (M = 16.41, SD = 1.29) than for the baseline (M = 15.20, SD = 1.34), t (23) = -7.75, $p < .001$, or early conversation period (M = 16.14, SD = 1.35), t (23) = -2.15, p = .042. Also, RESP was significantly faster for the early conversation period than for the baseline period, t (23) = -4.75, $p < .001$. Moreover, there was no significant difference in RESP between the neutral and conflictual or neutral and pleasant; however, RESP was significantly faster for the conflictual conversation (M = 16.24, SD = 1.66) than the pleasant conversation (M = 15.73, SD = 1.16), t (23) = 2.65, p = .014.

For Respiratory Sinus Arrhythmia (RSA), ANOVA showed a main effect for mother/daughter but not for time, topic or conflict. A significant time x topic interaction was found. RSA was significantly greater for daughters (M = 6.28, SD = 1.85) than for mothers (M = 3.04, SD = 0.86). To interpret the time x topic interaction, t-tests were performed and indicated that during the conflictual

conversation, RSA was significantly higher for the baseline period (M = 5.04, SD = 1.74) than for the early conversation (M = 4.10, SD = 1.02), t (23) = 2.82, p = .010, or late conversation period (M = 4.06, SD = 1.04), t (23) = 2.53, p = .019, and RSA was significantly greater for the pleasant conversation than for the conflictual conversation during early conversation (M = 4.97, SD = 1.38 ; M = 4.10, SD = 1.02), t (23) = -3.73, p = .001, or late conversation period (M = 4.66, SD = 1.19; M = 4.06, SD = 1.04), t (23) = -2.41, p = .024.

The ANOVA on FPA percentage scores yielded a main effect for time but not for mother/daughter, topic or conflict. There were no significant interactions. FPA increases from baseline to the late conversation period (M = 102.48, SD = 16.33) was significantly different from the FPA decreases from baseline to early conversation (M = 96.68, SD = 13.74).

Summary. This portion of the data analyses did not support the hypothesis (2.7) that physiological arousal would be greater for the high-conflict group than the low-conflict group. The ANOVAs provided partial support for the prediction (2.6) that physiological arousal would be greater during the conflictual conversation than the other two conversations. It was found that RESP was faster during the conflictual conversation than the pleasant conversation. These ANOVAs provided additional information regarding the shorter PWTT and greater RSA and SCL for daughters than for mothers. Also, the levels of SCL, RESP and FPA increased after listening to the conversations, and a decrease in the level of RSA was observed after the conflictual conversation. This outcome is consistent with more stress for this topic over time. The conflictual conversation induced lower level of RSA than did the pleasant conversation.

The Predictors of Psychophysiological Responses of Mothers and Daughters during the Late Conversation Period of the Neutral, Conflictual and Pleasant topics

A series of stepwise multiple regression analyses explored the hypothesis (2.8) that physiological changes would be associated with the felt arousal and hedonic tone. The results of multiple regression analyses for the psychophysiological responses are presented in Table 44 and Table 45. Table 44 shows the predictors of physiological responses of mothers. Summary of the predictors of physiological responses of daughters is presented in Table 45.

The first series of multiple regression analyses examined the predictors of HR during the late neutral, late conflictual and late pleasant periods for mothers as the criterion variables. For late neutral period, excitement and humiliation were the significant predictor variables accounting for 30% and 20% of variance in HR of mothers respectively. During late neutral period, HR for mothers was associated with greater levels of excitement and humiliation for mothers. For late conflictual period, excitement, shame and humiliation emerged as the significant predictors accounting for 24%, 16% and 33% of variance in mothers' HR respectively. In the late conflictual period, HR was associated with higher levels of excitement and humiliation and lower level of shame for mothers. With respect to the late pleasant period, hedonic and stress from external factors were the only significant variables accounting for 21% and 20% variance in HR of mothers respectively. During the late pleasant period, greater HR was associated with lower levels of hedonic tone and higher levels of stress from external factors for mothers.

Table 44. *Summary of Stepwise Multiple Regression Analyses listing the Predictor Variables of Psychophysiological Responses of Mothers during the Late Conversation Period of each Topic (N = 24 dyads)*

Criterion Variable	Topic and Segment	Predictor Variable	Beta	R^2 Change	F Change	df	Sig of F Change
HR	-Late Neutral	Excitement	.55	0.30	9.41	1, 22	.006
		Humiliation	.44	0.20	5.32	1, 22	.031
	-Late Conflictual	Excitement	.49	0.24	6.98	1, 22	.015
		Shame	-.41	0.16	4.32	1, 22	.050
		Humiliation	.66	0.33	13.64	1, 21	.001
	-Late Pleasant	Hedonic Tone	-.46	0.21	5.95	1, 22	.023
		Stress: External Factors	.45	0.20	5.50	1, 22	.029
PWTT	-Late Conflictual	Anger	.41	0.17	4.33	1, 22	.049
	-Late Pleasant	Provocativeness	-.47	0.22	6.28	1, 22	.020
		Sullenness	.56	0.25	9.99	1, 21	.005
RESP	-Late Conflictual	Stress : External Factors	-.42	0.17	4.62	1, 22	.043
		Anxiety	-.41	0.17	4.54	1, 22	.045
SCL	-Late Neutral	Excitement	.42	0.18	4.76	1, 22	.040
		Placidity	-.49	0.24	6.91	1, 22	.015
	-Late Conflictual	Total Telic Score	.42	0.18	4.68	1, 22	.042
FPA	-Late Neutral	Anxiety	.47	0.22	6.15	1, 22	.021
		Virtue	-.48	0.23	6.41	1, 22	.019
	-Late Conflictual	Boredom	-.43	0.19	5.07	1, 22	.035
	-Late Pleasant	Seriousness	-.46	0.21	5.96	1, 22	.023
RSA	Nil						

Notes. *P*-of-F-to enter ≤ 0.05, *p*-of-F-to remove ≥ 0.10

Table 45. *Summary of Stepwise Multiple Regression Analyses listing the Predictor Variables of Psychophysiological Responses of Daughters during the Late Conversation Period of each Topic (N = 24 dyads)*

Criterion Variable	Topic and Segment	Predictor Variable	Beta	R^2 Change	F Change	df	Sig of F Change
HR	-Late Conflictual	Pride	.48	0.23	6.48	1, 22	.018
	-Late Pleasant	Anxiety	.46	0.21	5.83	1, 22	.024
PWTT	-Late Neutral	Anxiety	-.44	0.19	5.20	1, 22	.033
	-Late Pleasant	Anxiety	-.41	0.17	4.43	1, 22	.047
RESP	-Late Conflictual	Stress : External Factors	-.48	0.23	6.56	1, 22	.018
		Stress : Body	.57	0.15	4.86	1, 21	.039
	-Late Pleasant	Modesty	.43	0.19	5.04	1, 22	.035
SCL	-Late Neutral	Relaxation	-.46	0.21	5.86	1, 22	.024
	-Late Pleasant	Relaxation	-.64	0.41	15.44	1, 22	.001
		Placidity	-.67	0.45	18.08	1, 22	<.001
FPA	-Late Neutral	Excitement	.63	0.40	14.73	1, 22	.001
	-Late Pleasant	Humiliation	.42	0.18	4.79	1, 22	.040
	-Late Pleasant	Guilt	.44	0.20	5.35	1, 22	.031
RSA	-Late Conflictual	Stress : External Factors	.47	0.19	7.66	1, 21	.012
		Effort : Body Stress	-.55	0.30	9.33	1, 22	.006
		Anxiety	-.44	0.19	5.21	1, 22	.033

Notes. *P*-of-F-to enter ≤ 0.05, *p*-of-F-to remove ≥ 0.10

The second series of analyses used PWTT of mothers as the criterion variable. For PWTT during the late neutral period, the analyses did not yield any significant predictor variables. For late conflictual period, anger was the only significant predictor accounting for 17% of variance in PWTT for mothers. In late conflictual period, greater level of anger was related to longer PWTT for mothers. With regard to late pleasant period, provocativeness and sullenness emerged as the significant predictors accounting for 22% and 25% of variance in PWTT for mothers respectively. In late pleasant period, PWTT was associated with lower level of provocativeness and higher level of sullenness for mothers.

For RESP for mothers, the analyses on late neutral and late pleasant periods did not yield any significant predictors. For late conflictual period, stress from external factors and anxiety were the significant predictors each accounting for 17% of variance in RESP for mothers. In late conflictual period, greater RESP was associated with lower levels of anxiety and stress from external factors for mothers.

With regard to SCL for mothers, the analyses on late pleasant period did not lead to any significant predictors. For the late neutral period, the significant predictors were excitement and placidity accounting for 18% and 24% of variance in SCL for mothers respectively. Higher SCL was related to higher excitement and lower placidity for mothers. For the late conflictual period, the total telic score was the only significant predictor accounting for 18% of variance in SCL for mothers. During the late conflictual period, greater total telic score was associated with higher SCL for mothers.

The fifth series of analyses used FPA of mothers as the criterion variable. For the late neutral period, the significant variables which predicted FPA were anxiety and virtue accounting for 22% and 23% variance in FPA for mothers. During the late

neutral period, greater FPA was related to higher level of anxiety and lower level of virtue for mothers. For the late conflictual period, boredom was the only significant variable accounting for 19% of variance in FPA of mothers. Greater FPA was related to lower level of boredom for mothers. With regard to the late pleasant period, seriousness was the only significant predictor accounting for 21% of variance in FPA for mothers. There was an inverse association between greater FPA and higher seriousness for mothers.

The last series of analyses examined RSA of mothers as the criterion variable. The analyses yielded no significant predictor variables.

Another series of multiple regression analyses examined the predictors of psychophysiological responding of daughters. For HR of daughters, the analyses on the late neutral period did not yield any significant predictor variables. For the late conflictual period, pride was the only significant predictor variable accounting for 23% of variance in HR of daughters. In late conflictual period, greater HR was related to higher level of pride for daughters. For the late pleasant period, anxiety was the only significant variable which predicted HR of daughters (21%). During this period, higher levels of HR was associated with greater level of anxiety for daughters.

The next series of analyses explored the predictor variables of PWTT for daughters. For the analyses on late conflictual period, there were no significant predictor variables. Anxiety was the only significant predictor variable which accounted for 19% and 17% of variance in PWTT for daughters during the late neutral and late pleasant periods respectively. Higher levels of anxiety was associated with shorter PWTT for daughters.

For RESP of daughters as the criterion variable, the analyses on the late neutral period did not yield any significant predictor variables. For the analyses on late conflictual period, stress from external factors and body stress were the significant variables accounting for 23% and 15% of variance in RESP for daughters respectively. Greater RESP was related to lower level of stress from external factors and higher level of body stress for daughters. With regard to the late pleasant period, modesty was the only significant variable accounting for 19% of variance in RESP for daughters. Greater late pleasant RESP was associated with higher level of modesty for daughters.

With regard to the SCL of daughters as the criterion variable, the analyses on late conflictual period did not yield any significant predictor variables. Relaxation emerged as the significant predictor accounting for 21% and 41% of variance in SCL during the late neutral and late pleasant periods respectively. There was an inverse association between greater relaxation and higher SCL. For late pleasant period, placidity was another significant predictor variable accounting for 45% of variance in SCL for daughters. Higher SCL was related to lower placidity for daughters.

In late conflictual period, the analyses on FPA of daughters produced no significant predictor variables. During late neutral period, excitement was the only significant variable accounting for 40% of variance in FPA for daughters. Higher FPA was related to greater excitement for daughters. For the late pleasant period, humiliation and guilt were the significant variables accounting for 18% and 20% of variance in FPA for daughters. Greater FPA was related to higher levels of humiliation and guilt for daughters.

For RSA of daughters as the criterion variable, the analyses on late neutral and late pleasant period did not yield any significant predictor variables. For the late

conflictual period, stress from external factors, effort for body stress and anxiety emerged as the significant predictors accounting for 19%, 30% and 19% of variance in RSA of daughters respectively. Greater RSA was associated with higher level of stress from external factors and lower levels of effort for body stress and anxiety for daughters.

Summary. This subsection of the data analyses provided partial support for the hypothesis that the physiological changes would be associated with felt arousal and hedonic tone (2.8). Different measures of somatic emotions indicating various levels of felt arousal, telic/paratelic-negativistic/conformist metamotivational state and hedonic tone (e.g., anxiety, boredom and provocativeness) were associated with changes in some psychological responses of mothers and daughters during late conversation period of each topic. The findings provided additional information in that the levels of tension/effort stress from body and external factors and transactional emotions (e.g., pride and humiliation) were also associated with physiological changes during the conversations.

Discussion

Experiment 2 examined the emotional and psychophysiological processes in the low-conflict and high-conflict mother-daughter dyads using reversal theory to account for emotional experience. Discussion of the results comprises four parts. Given that the data regarding motivational styles may be relevant to the interpretation of results on the emotional and physiological responding, the hypotheses regarding the motivational profiles of the participant will be discussed. The second part of the

discussion involves comparison of the emotional processes in the low-conflict and high-conflict dyads. The third part of the discussion concerns the physiological responding of mother-daughter dyads in the two groups. The last part involves the emotional predictors of physiological responding in mothers and in daughters.

Motivational Styles in the Low-conflict and High-conflict Mother-Daughter Dyads

The motivational styles of participants which involved partitioning and reanalysis of data collected for Experiment 1, were examined to explore differences between motivational styles of the low-conflict and high-conflict mothers and daughters, also ascertain if the mother-daughter differences found for 63 dyads in Experiment 1 hold true for the 24 dyads in Experiments 2 and 3.

Overall, the motivational profiles of mothers and daughters in this experiment match those of participants in Experiment 1.

Mother-daughter differences. The findings that mothers were more serious, arousal-avoiding and conformist dominant than daughters concur with the results of Experiment 1. The higher scores of paratelic (playful and arousal-seeking) dominance for daughters are consistent with other data on the developmental trend for telic/paratelic dominance (Murgatroyd, 1985b; O'Connor, 1992). Daughters' higher scores on negativistic dominance is also consistent with previous data on age and negativitism (McDermott, 1988a; O'Connor, 1992). Also, in line with Experiment 1, the scores on alloic salience was greater for mothers than daughters, and daughters had greater scores on arousal-avoiding/arousal seeking salience than

did mothers. However, in contrast with the results of the Experiment 1, the scores of mothers on optimism and autic-mastery dominance were not significantly higher than those of daughters; and daughters did not have greater scores on autic-mastery and autic-sympathy subscales and autic-mastery/autic-sympathy salience. Mothers' greater score on alloic-mastery subcale was consistent with the results of Experiment 1.

Group differences. It was hypothesized (2.2) that mothers in the high-conflict families would be less alloic-mastery dominant and more autic-mastery dominant and pessimistic than their counterparts in the low-conflict families. The findings do not support this prediction. However, there were non-significant trends regarding greater levels of pessimism for mothers and daughters in the high-conflict group than those in the low-conflict group. It is likely that the conflictual context of the family has affected their hope and expectation towards pleasant outcomes in their life. t-tests showed that mothers in the high-conflict group had significantly greater scores in individual tendency towards emotionality than mothers in the low-conflict group. This finding suggests that mothers in the high-conflict group were more likely to become emotional in their relationship.

The prediction (2.1) that daughters in the high-conflict families would be more arousal-seeking and negativistic dominant than their counterparts in the low-conflict families was not confirmed by the results. However, the findings revealed that mother-daughter differences in dominance for some of the metamotivational pairs varied across groups. In the low-conflict groups, mothers were more serious-minded than daughters while in the other group the difference was a non-significant trend. Differences in serious-mindedness are to be expected from age alone.

However, daughters in the high-conflict group had higher telic scores-presumably due to perceived conflict or anxiety. In the high-conflict group, daughters had significantly greater scores in arousal-seeking and defiance subscales, arousal-seeking dominance and defiance-compliance salience than did mothers. For the low-conflict group such distinctions were not evident. O'Connor (1992) found that arousal orientation influences compatibility in that mothers prefer telic (arousal-avoiding) daughters more than paratelic (arousal-seeking). It is possible that greater levels of difference in arousal orientation for mothers and daughters in the high-conflict group results in greater incompatibility and perceived conflict. There were other mother-daughter differences which were exclusive to the low-conflict group. In this group, mothers had significantly greater scores on alloic salience and alloic-mastery subscale. It is suggested that, in such families, mothers are more concentrated on the issues and concerns of others than their own, and this may be instrumental in avoiding or reducing conflict. Also, for these mothers, higher scores on alloic-mastery subscale indicates that, concentration on others is accompanied by a desire to take on and achieve sensible/realistic control or mastery for others (their daughters). These mother-daughter differences were not observed in the high-conflict group.

Emotional Experience for the Low-conflict and High-conflict Dyads

This part of Experiment 2 compared two groups of the high-conflict and low-conflict dyads in terms of the metamotivational operative state, arousal, stress, tension/effort-stress for body and external factors, and pleasant/unpleasant somatic and transactional emotions before and after listening to the neutral, conflictual and pleasant conversation topic.

Before discussing the hypotheses of this experiment, it is important to mention a mother-daughter distinction which was found for the high-conflict group. In this group, provocativeness was significantly greater for daughters than their mothers indicating that daughters in this group were in the paratelic/negativistic state. Given the definition of provocativeness as a tendency to arouse anger, annoyance and controversy (Hornby, 1990), the finding may not be surprising. The difference between provocativeness for mothers and daughters in the high-conflict group is consistent with significant mother-daughter differences in arousal-seeking and defiance subscales, arousal-seeking dominance and defiance-compliance salience in the high-conflict group. This outcome provide partial support for the contention that parent-child problems arise out of an incompatibility between family members in terms of the telic-paratelic or negativistic-conformist mode opposition (Apter, 1982, 1989; Apter & Smith,1979). O'Connor (1992) found that mothers like arousal-avoiding and conformist daughters more than arousal-seeking and negativistic daughters.

It was postulated (2.3) that daughters in the high-conflict group would experience greater levels of unpleasant somatic and transactional emotions than daughters in the low-conflict group. The findings did not support the hypotheses. However there were unexpected findings in that provocativeness was greater for daughters in the high-conflict families than those in the low-conflict families. It is suggested that daughters in the high-conflicted group experienced greater level of hedonic tone in a paratelic/negativistic state than daughters in the low-conflict group.

It was postulated (2.4) that the high-conflict group would experience greater levels of stress, unpleasant somatic and transactional emotions than the low-conflict group. The hypothesis was partially upheld. Although stress did not significantly

differ for the two groups, there was a non-significant trend in that the high-conflict group experienced a greater level of stress after the conflictual conversation than did the low-conflict group. Furthermore, stress for the high-conflict group increased significantly from before to after listening to the conflictual or pleasant conversation. The finding implies that the pleasant conversation can be a source of stress for the high-conflict group as is the conflictual conversation.

It was found that sullenness, a low-arousal paratelic/negativistic emotion, was greater for the high-conflict group than the low-conflict group. Furthermore, the high-conflict group experienced a greater level of sullenness after listening to the conflictual conversation than did the low-conflict group. For the low-conflict group, sullenness did not differ significantly before and after the three conversation topics. Also, for the high-conflict group, sullenness was significantly greater after listening to the conflictual conversation than after listening to the neutral conversation. For this group, sullenness was also greater after listening to the conflictual conversation than after listening to the pleasant conversation; however, this difference failed to reach significance. It appears that the hedonic tone in a paratelic/negativistic state was lower for the high-conflict group than the low-conflict group. The result of this experiment revealed that the level of sullenness was greater during the conflictual conversation than the other two conversations. It is apparent this effect of the conflictual conversation in generating a greater level of sullenness is exclusive to the high-conflict group.

With respect to the unpleasant transactional emotions, humiliation, an autic-mastery emotion was significantly greater for the high-conflict group than the low-conflict group. The data from this experiment showed that the conversations increased the levels of humiliation for the participants. However, this finding implies

that transactional loss in an autic-mastery state was greater for the high-conflict group than the other group. Also, there was a non-significant trend in that guilt was greater for the high-conflict group than the low-conflict group ($p = .051$). Also, after listening to the conflictual conversation, shame was significantly greater for the high-conflict group than the low-conflict group which suggests that listening to the conflictual conversation increased the transactional loss in an alloic-mastery state for the high-conflict group. The findings regarding the group differences in unpleasant transactional emotions reflect the greater level of transactional loss for the high-conflict group than the other group.

Overall, the results regarding the group differences in stress and unpleasant emotions is in line with previous data (Dix, 1991) introducing negative affects as discriminators of relationship satisfaction in parent-child dyads. However, the findings of this experiment extend the previous data on dyadic interactions by introducing the impact of mother-daughter differences in operative metamotivational state and metamotivational dominance on the emotional outcomes.

It was anticipated (2.5) that the low-conflict dyads would experience greater levels of hedonic tone and pleasant somatic and transactional emotions than the high-conflict dyads. The hypothesis was not supported by the data. The levels of hedonic tone and pleasant somatic emotions did not differ significantly for the two groups. Also, there was an unexpected non-significant trend in that provocativeness a pleasant high-arousal paratelic/negativistic emotion was greater for the high-conflict group than the low-conflict group.

For the pleasant transactional emotions, there were unexpected outcomes. The main effects for conflict showed that pride, gratitude and virtue were significantly greater for the high-conflict group than the low-conflict group. The

afore-mentioned group differences in unpleasant transactional emotions revealed that the transactional loss was greater for the high-conflict group than the low-conflict group. In this respect, the greater level of transactional gain for the high-conflict group requires careful interpretation. Here, the cognitive and behavioural factors contributing to greater levels of pride is unknown. However, pride might be the result of getting one's way or being a successful bully. The finding that the high-conflict group experienced greater levels of gratitude than the other group might result from the fact that the dyads in the low-conflict families, in contrast to the other group, take the pleasant outcome of their interaction for granted. This finding may be accounted for by the fact that the less frequently a behaviour is repeated, the more likely that it will be perceived as change, and thus, its causal status as an instigator of emotion is likely to increase (Dillard, 1993). In other word, for the high-conflict group, the daily interactions are less likely to include pleasant aspects. Therefore, if such outcomes occur, it is likely to be perceived as a positive change and hence instigate pleasant emotions. For the low-conflict group, these good aspects of dyadic interaction are more common and do not induce the same level of positive affects. Many dyads admitted that they did not regularly engage in conversation in the way they did during Experiment 1. This type of interaction might be even less frequent for the high-conflict families. In this regard, comparison of the different types of families in terms of their expectations of the upcoming interactions could be worth-investigating. Furthermore, there is an issue regarding the meaning of virtue for participants. A few dyads reported that they perceive virtue as the feelings of being a self-righteous religious person. The results of Experiments 1 and 2 did not yield any significant changes in virtue from before to after the three conversation topics. It is likely that virtue has a connotation for people different than what is meant by reversal

theory. In other words, the group differences in virtue might be caused by the fact that, virtue for mother-daughter dyads means feelings of self-righteousness combined with a belief in the others' wrong-doing.

On the whole, the findings regarding the group differences in pleasant somatic and transactional emotions provides new information in that the level of hedonic tone and transactional gain in some pairs of metamotivational states could be greater for the high-conflict group in a structural conversational interaction. However, the cognitive and behavioural factors contributing to these differences remains unclear.

Psychophysiological Processes in Mother-Daughter Dyads

This area of investigation examined the psychophysiological reactions of the low-conflict and the high-conflict mother-daughter dyads in response to listening to their neutral, conflictual and pleasant conversations. This part also explored the emotional and metamotivational predictors of psychophysiological responding of mothers and daughters.

Before discussing the hypotheses regarding the psychophysiological responding of participants, it is necessary to mention the mother-daughter differences in psychophysiological responding and the impact of all conversations on the psychophysiological processes in mother-daughter dyads.

The findings showed the greater levels of RSA (higher parasympathetic tone) and SCL (higher sympathetic tone) and shorter PWTT (higher sympathetic tone) for daughters than for mothers. The mother-daughter differences in PWTT and RSA could be related to age differences (Stern, 1980). PWTT could be related to age via blood pressure increased levels in mothers. Also, SCL might decrease in mothers

because of hand cooling due to sitting still in the lab together with age related changes in SCL (Stern, 1980). However, the greater levels of sympathetic arousal for daughters, in the form of higher SCL and shorter PWTT, is consistent with the findings that daughters experienced greater levels of high-arousal somatic emotions of anger and provocativeness than did mothers.

The results regarding the impact of all conversations on the psychophysiological processes are contradictory. On the one hand, the findings on RESP indicate that sympathetic arousal increased after listening to the conversations. Greater RESP indicates faster breathing which is a function of sympathetic arousal (Stren et al., 1980). However, increase in FPA from the baseline period to the late conversation period is not consistent with this interpretation because increased sympathetic arousal produces decreases in FPA (Brownley et al., 2000). On the other hand, the findings regarding decline in skin conductance levels from baseline period to early conversation and late conversation periods show decrease in sympathetic arousal. However, the data regarding the increases in the levels of VAS rating of arousal, felt arousal and stress lends support to the interpretation that sympathetic arousal increased after listening to the conversations.

It was hypothesized (2.6) that physiological arousal would be greater for the conflictual conversation than the neutral or pleasant conversation. The hypothesis was partially upheld. Among the physiological measures, RESP and RSA differentiated the impact of the three topics. RESP was greater during listening to the conflictual conversation than the neutral or pleasant conversation suggesting a higher level of sympathetic arousal during the conflictual conversation than the other two conversations. This interpretation is supported by the results of this experiment and those of Experiment 1 that felt arousal and anger was greater during the conflictual

conversation than other conversations. Given that the participants in Experiment 2 were a part of those in Experiment 1, the similarity in results of these two experiments indicates reliability of reversal theory measures of emotions and metamotivational states. Also, the outcome could stem from the content of the conflictual conversation. The receipt and sending of criticism, conflict, or confrontation expressed in client-therapist dyads were found to be associated with changes in greater autonomic activity (DiMascio et al., 1957; McCarron & Appel, 1971). Levenson and Gottman (1983, 1985) found that family conflict causes psychophysiological arousal among disputants. The data is not surprising, given the higher possibility of criticism and confrontation during conflictual conversation, and the results of this experiment regarding the highest levels of felt arousal and anger and lower levels of relaxation and placidity for this conversation topic.

The results of this section also revealed that, for dyads, the RSA during early and late conversation periods was higher for the pleasant conversation than the conflictual conversation. "RSA is considered to be a noninvasive index of cardiac parasympathetic (vagal) tone" (Lane et al., 1992, p. 461). Lane et al. (1992) found that higher RSA scores were negatively correlated with higher blood pressure and positively associated with a faster adaptation of heart rate during stress, which indicates the development of parasympathetic antagonism to ongoing sympathetic arousal. Although, the level of stress did not significantly differ across topics, the higher level of felt arousal, and lower level of hedonic tone in the form of lower levels of relaxation and placidity and higher level of anger and sullenness during the conflictual conversation could be the reason behind the differences between RSA for the pleasant and conflictual conversations. Moreover, Porges (1995) argues that elicitation of unpleasant and pleasant affects is associated with decrease and increase

in RSA respectively, namely, RSA measures the hedonic tone whereas the FPA, RESP and SCL only reflect ANS (sympathetic) arousal. This findings reflect the importance of the conflictual conversation in escalating the autonomic reactivity of the participants. However, it is not certain why the HR and FPA did not vary across conversations. It is possible that the relaxed and solitary nature of the experimental setting has minimised the level of autonomic reactivity. While actual conversation might produce greater biological validity, it is not possible to remove the effects of speech on RESP changes from autonomic nervous system response measurement. Furthermore, there exists a possibility that habituation (Stern, 1980) to the stimulating effect of listening to conversation on physiological arousal has affected the mean scores of the physiological measures. Stern, Gaupp, and Leonard (1970) found that expectancy of the nature of the stimulus increases habituation. In this experiment, the participants were aware of the content of the recorded conversations.

It was anticipated (2.7) that physiological arousal would be greater for the high-conflict dyads than the low-conflict dyads. The data did not support the hypothesis. The two groups did not differ in terms of their psychophysiological responses to the conversations. These findings are in contrast with a previous study by Wright et al. (1992) which revealed that parental reports of greater conflict were associated with greater systematic vascular resistance and lower cardiac index increases to exercize. Levenson and Gottman (1985) found that physiological arousal was not reflective of the present state of interaction but as an indicator of a decline in marital satisfaction. Another explanation is the possibility that physiological responses of the participants have been under the influence of individual response stereotypy (Stern, 1980) which refers to the individual differences in patterns of physiological responding to the same stimulus in which

some individual might respond strongly in one physiological system (e.g., HR) and others in different systems. The impact of individual differences in patterns of autonomic arousal could contribute to both increased and decreased between-group variance when the number of participants in each group is small.

It was hypothesized (2.8) that physiological arousal would be associated with the rating of felt arosual and hedonic tone. This hypothesis was partially confirmed. In this respect, the findings will be compared for mothers and daughters and across the three conversation topics.

For mothers, both high-arousal and low-arousal emotions were associated with higher levels of physiological arousal. In late neutral period, there were positive associations between greater excitement and higher level of HR (also in late conflictual period) and greater SCL, and between lower placidity and greater SCL. These finding suggest that, for mothers, both high-arousal and low-arousal emotions were related to higher levels of sympathetic arousal, and that low hedonic tone in telic state and high hedonic tone in paratelic state gave rise to sympathetic arousal. There were other findings which supported this interpretation. There were positive associations between longer PWTT and lower level of provocativeness and higher levels of sullenness (in late pleasant period). However there were other findings which were not consistent with this interpretation: in the late conflictual period, there were positive associations between greater anxiety and higher level of FPA (also in late neutral period), between greater anger and longer PWTT, and between greater anxiety and lower RESP. These surprizing outcomes could raise the possibility that sympathetic activation decreased because mothers attempted to cool down and relax and take deep breath during the conflictual conversation.

The results of the predictors of physiological responses of mothers showed that both telic and paratelic emotions were related to higher level of sympathetic arousal. Also, there were associations between greater total telic score and SCL (in late conflictual period) and between lower seriousness and greater FPA (in late pleasant period) which indicate the positive association between the telic state and sympathetic arousal. Taken together, the findings of this section are both consistent and in contrast with previous data (Apter & Svebak, 1989; Rimehaug & Svebak, 1987; Svebak;1982; Svebak, 1986a; Svebak 1986b; Svebak,1991; Svebak & Murgatroyd, 1985) which suggests that higher cardiovascular activity is exhibited by people who are in a telic state. For mothers, both plausible and unexpected findings were found for other clusters of predictor variables.

It was found that greater stress from external factors was related with lower RESP (in late conflictual period) and greater HR (in late pleasant period). Furthermore, greater HR was associated with lower hedonic tone (in late pleasant period). Although the positive association between stress from external factors and HR is plausible, no explanation can be made for the predictive value of this kind of stress for lower RESP. The results regarding the transactional emotions revealed that both transactional gain and transactional loss could be related to physiological arousal. There were associations between greater HR and greater humiliation (both in late neutral and late pleasant periods) and lower shame (in late conflictual period), and between greater FPA and lower virtue (in late neutral period). In this respect, the cognitive and emotional factors that mediate between the transactional emotions and sympathetic arousal remains unknown.

For daughters, the findings regarding the predictors of physiological arousal was similar to that of mothers. However, the findings regarding somatic emotions of

daughters were less contradictory than those of mothers. With respect to somatic emotions, there were associations between higher level of anxiety and greater HR (in late pleasant period), lower RSA (late conflictual period) and shorter PWTT (in both late neutral and late pleasant periods), between higher SCL and lower relaxation (in both late neutral and late pleasant periods) and lower placidity (in late pleasant period). These findings indicates that, for daughters, low hedonic tone in telic state is related to higher level of sympathetic arousal. However, positive association between greater excitement (a high arousal emotion) and greater FPA (in late neutral period) is not understood. The inverse association between anxiety and RSA lends support to Porges's (1995) contention that higher RSA is related to lower level of negative affect.

For daughters, the findings revealed associations between greater stress from external factors and lower RESP (in late conflictual period) and greater RSA. For the inverse association between RESP and stress for external factors which was also found for mothers, no explanation can be made. With respect to the positive association between this kind of stress and RSA, it is suggested that increase in RSA could be an adaptive somatic response to the experience of stress from external factors. This interpretation is consistent with Lane et al.'s (1992) finding that higher RSA was positively associated with a faster adaptation of HR during stress, which suggests the development of parasympathetic antagonism to ongoing sympathetic arousal. This explanation is supported by the afore-mentioned finding that this kind of stress was related to lower late conflictual RESP for mothers and daughters because lower RESP increases RSA. There was association between greater RESP and body stress which suggest that the conflicutal conversations produced body stress

which gave rise to RESP. However, the reason behind the positive relationship between higher RSA and lower effort for body stress remains unclear.

With regard to the transactional emotions of daughters, it was found that both transactional gain and loss were related to higher level of physiological arousal for daughters. There were positive associations between pride and HR (in late conflictual period) and between modesty and RESP (in late pleasant period). The predictive values of pride and modesty demonstrates that greater transactional gain is related to higher sympathetic arousal. However, in late pleasant period, the analyses revealed positive associations between greater FPA and higher levels of guilt and humiliation (in late pleasant period). These outcomes indicate that transactional loss could decrease sympathetic arousal. Also, association between greater level of guilt and higher FPA is opposite with empirical evidence regarding the strong correlation between expression of guilt and increased HR of patient and therapist (DiMascio et al., 1957). This could be related to the afore-mentioned disparities in the predictors of sympathetic arousal between FPA and other physiological measures. It is also likely that FPA is not a reliable measure.

On the whole, the findings regarding the predictors of psychophysiological responses of mothers and daughters have several implications. The results demonstrate the value of reversal theory measures of telic state, tension/effort stress and somatic and transactional emotions in accounting for various physiological responses of mothers and daughters during neutral, conflictual and pleasant interactions. Second, the comparison of the analyses across the three conversation topics shows that unpleasant and pleasant somatic and transactional emotions can be related to somatic changes during each conversation topic. For instance, the unpleasant emotions are not necessarily related to somatic changes during the

conflictual conversation. Also, there were both similarities and differences in pattern of data for mothers and daughters. Except for the contradictory findings regarding the predictors of PWTT and RESP of mothers, the data showed that low hedonic tone in telic state and high hedonic tone in paratelic state could give rise to physiological arousal. Moreover, greater levels of both transactional gain and loss were related to higher levels of sympathetic arousal. However, the cognitive and behavioural factors that mediate between sympathetic arousal and transactional emotions should be the focus of further investigation. Finally, the data provided additional evidence that telic state and measures of tension/effort-stress are associated with physiological arousal.

Conclusion

Experiment 2 investigated the emotional and physiological processes for the low-conflict and high-conflict mother-daughter dyads during the neutral, conflictual and pleasant conversation topics. The finding of this experiment confirmed significant utility of reversal theory in distinguishing the pattern of the emotional processes for mother-daughter dyads in the two groups of families. The findings demonstrate the capacity of the theory to uncover new areas of difference between the high-conflict and low-conflict families. The findings revealed that the pleasant and unpleasant features of emotions do not sufficiently distinguish the two types of families. Instead, there are other distinctive features which are accounted for by metamotivational state and dominance of the individual. The mother-daughter differences in each group point to the existence of the paratelic/conformist emotions for mothers in the low-conflict group and the paratelic-negativistic emotions for daughters in the high-conflict group. The level of hedonic tone in paratelic state was

greater for daughters in the high-conflict group than their counterparts in the other group. The data is consistent with the existence of significant mother-daughter differences in arousal orientation in the high-conflict group. However, the low-conflict and high-conflict dyads mostly differed in terms of transactional outcomes. In terms of somatic emotions, the group differences were limited to a greater level of sullenness, a low-arousal paratelic/negativistic emotion, for the high-conflict group. However, the high-conflict group reported greater levels of transactional loss in terms of humiliation, resentment and shame and transactional gain in the form of pride, virtue and gratitude. The contradictory nature of results regarding transactional loss and gain for the high-conflict group indicate that the underlying cognitive and behavioural factors behind group differences in transactional gain and loss warrant further investigation..

The findings regarding the psychophysiological processes for mothers and daughters highlight a few important points. Firstly, listening to the conversations increased the level of sympathetic arousal with the conflictual and pleasant topic having the most and least impact on the autonomic arousal respectively. The second point revealed by the psychophysiological data was that sympathetic arousal was greater for daughters than mothers. Future research is required to investigate to what extent mother-daughter differences in sympathetic arousal are due to age differences and to what extent they are affected by qualitative and quantitative differences in emotional experience.

The findings regarding the predictors of physiological responding confirmed the capacity of reversal theory in elucidating the relationship between emotional and psychophysiological processes. In this respect, the similarity and difference in data regarding mothers and daughters implies the importance of particular emotions in

accounting for the physiological responses of mothers or daughters; and the possibility that the same emotional and somatic changes are rated differently by mothers and daughters. During each of the conversation topics changes in both pleasant and unpleasant emotions have substantially predicted changes on some measures of autonomic reactivity. For the somatic emotions, the predictive values of relaxation, excitement, placidity and provocativeness suggest that, both low hedonic tone in a telic state and high hedonic tone in a paratelic state are associated with higher levels of sympathetic arousal. The findings validate the central role of metamotivational states in experiencing the same somatic changes and felt level of arousal as pleasant or unpleasant. The emergence of guilt, humiliation, modesty and virtue as predictors of autonomic arousal indicates that transactional emotions, while not based on the somatic pairs of metamotivational states, may affect the level of autonomic arousal. Comparison of the salience of somatic and transactional emotions and their impact on the level of somatic arousal could be a promising area of investigation.

In spite of intriguing data regarding group differences in emotional experience, the data did not yield any group differences in psychophysiological responding to the conversations. However, it should be noted that this experiment was conducted on non-distressed low-conflict and high-conflict mother-daughter dyads. The replication of data on more extreme groups such as low-conflict and problematic dyads might lead to greater differentiation of emotional and physiological responses .

A few methodological limitations should also be considered in the generalization of data. The small numbers in each group reduces the power of statistical comparisons and increasing the possibility of both Type 1 and Type 2

errors. The Type 1 errors arises from the fact that, due to the ratio of dependent variable to the number of participants in each cell, MANOVA could not be conducted. Also, Type 2 errors raises the possibility of rejecting real differences as being non-significant. There were a number of non-significant differences (between .05 and .10 probability). The statistical power and the pattern of results may change if the study were to be replicated with large numbers in each group. Furthermore, it is necessary to mention the likelihood of problems in physiological measurement. Given the inconsistency of emotional experience, the possibility exists that the measurement of physiological responses was performed at an inappropriate segment missing the particular emotion or operative state of the individual (Wagner, 1988).

Despite the methodological limitations, the results of this experiment have important implications for the counsellors working with families. The findings regarding group differences in emotional experience suggest that the impact of perceived conflict on emotional experience could reflect a combination of mother-daughter and group differences in metamotivational states/styles and the importance of the contextual factors in providing the level hedonic tone and transactional loss/gain for the members of dyads. The family therapists should not only search for the unpleasant emotional outcomes of the conflictual interaction for the high-conflict dyads but also explore different kinds of hedonic tone and transactional gain that interpersonal interaction provide for the particular metamotivational state of each member of the family with particular metamotivational dominance. The counsellors can help the problematic families to become aware of these processes, and help them to achieve the optimal hedonic tone and transactional gain through neutral and pleasant interactions. The data that physiological measures were related to the emotional arousal has important implication for family therapist. The problematic

family dyads should be guided to pay attention to their somatic arousal, perhaps through bio-feedback devices, when they are engaged in different kinds of interactions. It is likely that bodily sensations during conversations have an important role in the extent to which the members of dyads avoid conflictual conversations they find unpleasant in a particular metamotivational state or alternatively engage in intense conversations they find enjoyable in a different metamotivational state.

Chapter 5

Experiment 3

Chapter 5

Experiment 3

Physiological Linkage in Mother-Daughter Dyads

The assumption of physiological linkage originated from previous investigations on shared emotions in parent-child and marital dyads. Laboratory studies of marital interactions (Gottman, 1979) revealed a cycle of negative and positive emotions between husbands and wives, especially in distressed families. More recently, Larson and Richards (1994) found modest correlations between the momentary affective states of adolescents and their parents. They report that emotional responses of daughters were picked up by others. Their findings imply that if emotions can be transferred from one member of a family to another, this can link the physiological responses of the family members.

Studies of shared physiology, defined as the linkage between the physiological responses of two people, was first demonstrated in studies of psychotherapy and psychodiagnosis (Levenson & Ruef, 1992). The results of studies with client-therapist dyads indicate the correlation between empathy and covariation of client's and therapist's heart rate, skin conductance response and the observer rating of the therapist's empathy (Coleman et al., 1956; DiMascio et al., 1955; DiMascio et al., 1957). Kaplan and Bloom (1960) interpreted this linkage as a physiological expression of empathy. Later studies confirmed a relationship between HR of client and therapist during transference and contertransference periods of psychodynamically structured interviews (Stanek, Hahn, & Mayer, 1973). There is evidence for an association between the client's perception of the therapist's empathy and covariation of the client's and therapist's SCRs (Robinson et al., 1982). The

study conducted by Robinson et al. (1982) was successful in reflecting covariation in a phasic response but failed in demonstrating the same results with a tonic response of finger skin temperature (FST). Wagner and Calam (1988), on the basis of these findings, suggested that physiological linkage does not indicate a long-lasting state of empathy but the more rapid emotional responses during the interaction which reflect the temporal differences in empathy or in the client's perception of the counsellor's empathy. The attribution of physiological linkage to the affective exchange of empathy or rapport in a harmonised therapeutic context might seem in contrast with the finding that covariation of GSR was greater for people who disliked each other than when the discussants liked each other or were in neutral combination (Kaplan et al., 1964). However, the studies on physiological linkage in married couples opens a new perspective on the investigation of shared physiology.

Physiological linkage in family dyads. Levenson and Gottman (1983) studied thirty married couples during naturalistic interactions to determine the extent to which variation in marital satisfaction could be accounted for by physiological and affective patterns between and within couples. The researchers advanced the methodology applied in client-therapist studies by using bivariate time-series which overcame the contaminating effect of autocorrelation within the data from the same individual or crosscorrelation between individuals in such data. Heart rate, skin conductance, pulse transmission time, and somatic activity from both spouses were analyzed using bivariate time-series techniques to derive a measure of physiological linkage. Self-report affective data (obtained by a dial rating of positive/neutral/negative affect during a video-recall procedure) were analyzed using sequential analyses to derive a measure of affect reciprocity. The authors reported

that the physiological linkage and the observed emotional expression for married couples was greater during the discussion of high-conflict issues than during low-conflict discussion on an event of the day. They also found that physiological covariation during discussion of the high-conflict issue accounted for over 59% of the variance in marital satisfaction. Although the self-rating of affect increased the variance accounted for by 16%, the affective measures were not correlated with the physiological measures. Faced with this striking data, Levenson & Gottman (1983) concluded that "Physiological linkage reflects the ebb and flow of the negative affect, the escalation and de-escalation of conflict, and the sense of being locked into the interaction and unable to step back that can occur when spouses in dissatisfied marriages attempt to solve problems and when this kind of patterned conflict occurs in other dyadic interaction" (p. 596).

In a follow-up study conducted 3 years later, Levenson and Gottman (1985) found that it was not physiological linkage but physiological arousal which was the predictor of decline in marital satisfaction. With regard to these data, Wagner and Calam (1988) asserted that the physiological linkage, as a dynamic measure of the affective changes during the interactions can reflect the present state of relationship and will vary with marital satisfaction. They also attributed physiological arousal to the reflection of emotions which are not necessarily expressed during the interaction and might stem from the individual's attempt to avoid destructive interactions.

In a further attempt to explore the relationship between empathy (defined as the ability to perceive accurately how another person is feeling) and physiology, Levenson and Ruef (1992) conducted another experiment on married couples. Thirty one observers viewed 15-min marital interactions and used a rating dial to indicate continuously how they thought a designated spouse was feeling. Rating accuracy

was determined by comparing the observer's ratings with identical self-ratings obtained previously from the target spouse. This research yielded intriguing results in that accuracy of rating the negative emotion (i.e., the observer's ratings of the target spouse's emotion) was greater when observer and target evidenced high levels of physiological linkage whereas the accuracy of detecting positive emotion was related to a state of low arousal in the observer, but not to physiological linkage between observer and target. The researchers concluded that positive emotions do not produce the kind of patterned autonomic activity necessary for physiological linkage. Later exploratory analysis of physiological measures revealed that linkage in skin conductance and pulse transmission time were most consistently related to the rating accuracy of negative emotions. Accordingly, the researchers suggested that their findings were consistent with the biological accounts of emotions (Cannon, 1927) which have given particular emphasis to systematic nervous system activation in the service of negative emotion. The finding that rating accuracy of positive affect was associated with low levels of cardiovascular arousal (increased peripheral vasodilatation and lower HR) led the investigators to the assumption that "low cardiovascular arousal contributes to a cognitive state that is more conducive to greater cognitive demands associated with detection of positive as compared to negative state" (p. 243).

O'Mara (2001) examined the effect of empathic listening (by using turn-taking conversations instead of naturalistic conversations) on the physiological linkage in non-distressed couples. Using Levenson and Gottman's (1983) methodology, he also added a pleasant conversation in order to provide a context for a high level of positive affect. His results indicated that physiological linkage occurs when spouses listen empathically to each other's neutral, conflictual and pleasant

stories. The findings corroborated the Levenson and Ruef's (1992) interpretation that physiological linkage signifies the feeling component of empathy. O'Mara found that physiological linkage accounted for 51% of variation in marital satisfaction. Further, it represented more than simply the exchange of negative affect in the relationship, but also represented empathy in neutral and positive affective exchange.

The pioneering work of Levenson and Gottman (1983) on the psychophysiological and affective interdependencies of marital dyads was replicated for parent-child dyads (Wagner, 1988). Wagner and Calam (1988) used the methodology applied by Levenson and Gottman (1988) in their pilot study on six volunteer parent-child dyads. The participants were asked to take part in five low-conflict and high-conflict discussion tasks while physiological responses of HR and SCL were recorded. With regard to the children's ability to rate their feelings, their affect was measured by observer rating of the video-tapes of the interactions. Despite the small sample size, the experiment yielded compelling results. The experimenters found that, for four dyads, the physiological responses of the parent were predictable from the child's responses. However, for all of the six dyads, the influence of facial expression of emotions of one member of each dyad on the facial expression of the other member was reciprocal. The results showed that the direction of predicability of inter-beat-interval (IBI) tended to be the reverse of that for the affective expression. Wagner and Calam (1988) suggested that a private message system (Noller, 1984) or other unknown communication channels might be responsible for communicating the affective experience from one to the other to produce the IBI response. Unfortunately, the small sample size in this pilot study did not allow a comparison of family characteristics.

The data of previous research on the shared physiology in married couples provides strong support for the relationship between marital satisfaction, empathy and physiological linkage. However, these studies offer different interpretations of physiological linkage (although these interpretations are not mutually exclusive) as either an indicator of negative affect during the conflictual conversation for the distressed couples or an index of a high level of empathic listening in the overall interaction of non-distressed couples. The lack of agreement in these interpretations is partly caused by the measures of affect used in these studies. O'Mara (2001) did not use a measure which could identify different aspects of emotional experience during dyadic interaction, that is listening and conversing. His measures were limited to perspective taking and marital satisfaction. In another study (Levenson & Gottman study, 1983), a dial rating of affect is merely a measure of overall hedonic tone and thus does not present a complete picture of emotions. Furthermore, Levenson and Ruef (1992) noted that their study lacked information about how the participants felt during the discussions.

It can be argued that high levels of physiological linkage during the conflictual interaction and empathic listening raise the possibility that there are different factors that mediate between the physiological linkage and the content of the two various interactional contexts. Although, according to O'Mara's (2001) finding, perspective taking is related to the higher level of physiological linkage, the mechanisms that instigate the first step towards attending to or interpreting the other person's feeling might vary in different kinds of interactions. For instance, perception of a threat is more likely to give rise to the shared physiology in a conflict situation than a feeling of empathy. Furthermore, the operative metamotivational state of the individual at the time of interaction can determine his/her sensitivity

towards the flow and contents of a dyadic interaction. O'Mara (2001) commented that the discussion of a contentious issue could generate strong negative affect and associated physiological linkage. However, it is likely that even a trivial issue could arouse intense affective and physiological responses provided that the individual is in a particular state of mind that warrants such reactions.

The work on client-therapist dyads and married couples, concentrating on accuracy of ratings of the emotions of the target client/spouse, overlooked the impact of the target client/spouse's own emotions on physiological linkage. The ultimate effect of reading the affect of the other party is a generation of particular emotional response(s) and its concomitant physiological reactions. A thorough knowledge of the emotional experience of the individual during physiological linkage could elucidate the nature of the affective message(s) sent and received by members of a dyad. In this way, the physiological linkage is interpreted in the light of the subjective experience of both the sender and the receiver of an emotional message. Such an exploration requires a phenomenological approach which starts from the subjective experience of the individual and then moves towards the physiological reactions. Moreover, the extent to which a person reacts emotionally and physiologically to the responses of the other party is determined by his/her current metamotivational state. Everyone could compare different occasions during which, he/she reacted differently to the similar emotional and physiological responses of a relative or friend. For instance, a wife might express higher levels of emotional and physiological responses towards her husband's disclosure of a workplace adversity if she is in state of mind that render her caring and empathic rather than self-centered and preoccupied with her own problems at home.

The effect of the operative metamotivational state on the physiological linkage lies in the impact of somatic and transactional sets of states. The operative state of the sender in terms of the telic/paratelic and conformist/negativist state can serve to draw or shift away the attention of the receiver. In this respect, similarities or differences in operative metamotivational states between the sender and receiver may facilitate or impede the communication. The extent and direction of the physiological linkage between two persons may be affected by the degree to which they are in a telic/paratelic, negativist/conformist, mastery/sympathy and autic/alloic state. For instance, in an autic-mastery and negativistic state of mind, one might be less likely to attend and respond to the strong emotional suffering of someone else. In this way, the reversal theory concept of metamotivational state can be useful for the investigation of the physiological linkage during the dyadic interaction. Although, at the conceptual level, the operative metamotivational state of the members of a dyad and their somatic and transactional emotions could be related to the physiological linkage during the dyadic interaction, at an experimental level it is difficult to assess the metamotivational and emotional correlates of physiological linkage during mother-daughter dyadic interaction. In spite of this, in light of the afore-mentioned data on client-therapist and married couples, it is anticipated that the levels of felt arousal would be associated with the strength of physiological linkage during dyadic interaction (hypothesis 3.1).

The impact of relationship satisfaction on physiological linkage during dyadic interaction might be related to the degree to which the emotional and physiological responses of one member of a dyad draw the attention of the other member. The degree to which the relationship is regarded as conflictual or harmonised might muster the physiological activation of the individual and narrow its focus to attend to

and to mirror the physiological responding of the other person with whom an interaction is taking place. Levenson and Gottman (1983) revealed that physiological covariation during the discussion of high-conflict issues accounted for over 59% of the variation in marital satisfaction. Overall, the previous research on married couples and client-therapist data suggest that physiological linkage occur and would increase from the neutral to pleasant interactions and be highest for the conflictual interaction (hypothesis 3.3); furthermore, the high-conflict dyads would exhibit higher levels of the physiological linkage than the low-conflict dyads (hypothesis 3.4).

Asymmetry of the Physiological Linkage

In an attempt to reanalyse the concepts of *asymmetry* and *bidirectionality* in social behaviour, Gottman and Ringland (1981) maintained that both terms imply social influence, which could be assessed by *predictability*. *Predictability* means the extent to which emotional, behavioural and physiological responses of each member of a dyad predict the responses of the other member. "Dominance can be defined as asymmetry in predictability in social variables of importance, and bidirectionality as symmetrical predictability" (Gottman & Ringland, 1981, p. 404). For works investigating the relationship between emotional processes and physiological linkage, caution is needed to ensure that the results are not confounded with the higher frequency of particular behaviours from one member of a dyad. Gottman and Ringland (1981) asserted that the nature and context of an interaction will enable assessment of whether or not low or high frequency of a particular behaviour is an indication of asymmetry. Wagner and Calam (1988) found that, for most of the

parent-child dyads in their pilot study, the physiological responses of parents were predictable from those of their children. O'Mara (2001) commented that physiological linkage in Levenson and Gottman's (1983) study on married couples, in the absence of turn-taking conversations, could be an indicator of affective dominance. In this respect, the results of Wagner and Calam's (1988) study were consistent with an explanation of affective dominance within the dyad. However, Wagner and Calam did not control for the effect of a dominant speaker on the predictability of physiological data. It is likely that the parents in this study, in order to act according to social desirability, allowed more time for the children to speak and thus send more emotional messages to their parents.

Hofer et al. (1998) stated that "the asymmetry and complementarity of early parent-child relationships are changed continually towards greater reciprocity, mutuality, and quality" (p. 2). Given the transitory nature of adolescence, it is possible that the nature of parent-adolescent interactions vacillate between asymmetry and bidirectionality, which in turn, might render the parent or adolescent to be the dominant speaker. Hofer and Sassenberg (1998) conducted role play experiments for mother-daughter dyads and found that mothers tended to control the discourse while daughters tended to respond. Taking into account the paucity of empirical evidence regarding the asymmetry of physiological linkage during parent-adolescent interactions, it is not possible to use the literature to drive a hypothesis regarding the predictability of physiological linkage during mother-daughter dyadic interactions. However, if turn-taking conversations are arranged, leading the conversation would affect the asymmetry of physiological linkage. Taking into consideration that, by taking the role of a listener one would attend to the emotions

and feelings of the speaker (O'Mara, 2001), it is suggested that the physiological responses of the listener would follow those of the speaker (hypothesis 3.2).

Summary. The previous research on client-therapist, married couples and parent-child dyads demonstrates the existence of emotional and physiological linkages between the members of dyads. The empirical evidence presented by these studies highlights the association between physiological linkage and empathy or physiological linkage and relationship dissatisfaction. The contrasting key factors of empathy and relationship dissatisfaction are partly highlighted by the special focus of research on empathic relationships between client-therapist dyads and married couples. The emphasis on the accuracy of reading the other party's emotions, has shifted the attention of the researchers away from ones' own emotions which, while affected by the presence of the other party (through feeling empathic, threatened or furious towards him/her), operate within the subjective experience of the individual which depends on his/her metamotivational state. Moreover, previous studies have used measures of emotions which can not account for the complexity and richness of emotional experience. Therefore, to understand the mechanisms related to physiological linkage, a thorough knowledge of the emotional experience and metamotivational state(s) of the individuals during the dyadic interaction is required. Reversal theory with its comprehensive measures of emotions and metamotivational states may reveal explanations of this dyadic phenomenon which have been inaccessible to previous research. It is postulated that the levels of felt arousal would be associated with the strength of physiological linkage.

The previous studies exploring the physiological linkage within the neutral and conflictual conversational contexts seem to have overlooked the effect of a

pleasant context on physiological linkage between the members of dyads. The addition of a pleasant conversation should provide a context within which the effects of positive emotions can be examined. The comparison of physiological linkage between the low-conflict and high-conflict dyads should reveal the extent to which relationship dissatisfaction affects the shared physiology. Moreover, the salience of the different conversational contexts for the physiological linkage in each group can be compared. To control for the effect of a dominant speaker on the asymmetry of physiological linkage, implementation of the turn-taking during the conversations is indicated. While the listener is exposed to affective expressions and physiological responses of the speaker during each conversation, it is predicted that the physiology of the listener would follow that of the speaker.

Aims and Hypotheses

The aims of this experiment are; firstly, to examine the physiological linkage for the low-conflict and high-conflict mother-daughter dyads during neutral, conflictual and pleasant conversations; and secondly, to examine the predictors of physiological linkage across measures of emotions and metamotivational states.

Hypothesis 3.1. The levels of felt arousal would be associated with the strength of physiological linkage.

Hypothesis 3.2. The physiology of the listener would follow that of the speaker.

Hypothesis 3.3. The physiological linkage occur and would increase from the neutral to pleasant interactions and be highest for the conflictual interaction.

Hypothesis 3.4. The physiological linkage would be greater for the high-conflict group than the low-conflict group.

Method

Participants

This experiment used the same participants as Experiment 2. Full details are as described in the Participants section for Experiment 2.

Apparatus

Physiological measures. Four psychophysiological responses were recorded from each mother and daughter participant simultaneously using a Power Macintosh 7300/180 computer linked to a MacLab/8E data acquisition system using Chart version 3.5.6 software. Recordings were made with a sampling frequency of 200/s. The responses recorded and channel settings were as follows.

Channel 1 and 5. The electrocardiograph (ECG) was measured using 7mm Ag/AgCl electrodes fitted on both sides of the torso at the level of second rib with an earth reference on the left mastoid process. The electrodes were input through a BioAmp coupler: amplifier range was 2 mV full scale and the band-pass filter was 0.3 to 50 Hz.

Channel 2 and 6. The ECG signal was input to a second channel and converted to beat-to-beat heart rate (HR): the cardiotachometer range setting was 0 to 200 beats/min.

Channel 3 and 7. Finger pulse amplitude (FPA) was measured using a photoelectric plethysmograph fitted to the distal phalange of the second finger of the non-dominant

hand using a velcro fastener. The plethysmograph was connected through a GP Amp coupler with the amplifier range set at 20 mV and band-pass filtering from 0.3 to 10 Hz.

Channel 4 and 8. Skin conductance level (SCL) was recorded using 9mm Ag/AgCl contoured electrodes fitted to the distal phalange of the first and third fingers of the non-dominant hand with velcro fasteners and connected to a GSR coupler with the range setting at 20 μS. However, SCL was not scored and analyzed because, for a number of dyads, SCL data moved out of the range of the measuring equipment (i.e., plus or minus10 μS from the initial baseline setting). This problem led to the loss of SCL data for these dyads. Therefore, the SCL data was not included in this experiment.

Psychological measures. The Telic State Measure (TSM; Svebak & Murgatroyd, 1985) was used to measure telic/paratelic state. The Tension and Effort Stress Inventory (TESI; Svebak, 1991) was applied to explore tension/effort-stress from body and external factors, and to identify the operational somatic/transactional emotions. Visual Analogue Scales (VAS; McCormack et l., 1988) were used to examine psychological ratings of stress, arousal and hedonic tone. These measures were all used in the previous experiment and were described.

Procedure

Each mother-daughter dyad sat in comfortable upright chairs in a room at a distance of 1.5 m facing each other. The participants were given a full explanation of the purpose of the study and asked to sign a consent form. Then, the electrodes

for the physiological measures were attached to the participants, and measurement devices were tested. Mothers and daughters were asked to take turns at discussing a neutral, a conflictual and a pleasant topic while continuous physiological readings were taken. For each conversation topic, there were 4-minute baseline and two 8-minute conversation segments (mother lead the conversation, daughter lead the conversation), namely, 20 minutes was required for each conversation topic (a total of 60 minutes for the three topics). At the outset of the experiment, necessary instructions regarding the TESI, TSM and VAS were given. From an adjacent room, the experimenter monitored the conversations via an intercom and gave a signal to each dyad to start or stop a segment. During the baseline period, the dyads were asked to be silent and relaxed and to think of a neutral topic like making a drink of coffee. During the conversation turns, each participant was asked to listen quietly when the other person was talking. They were free to ask occasional questions for clarification but were instructed not to argue. This rule aimed to control for the effect of a dominant speaker on the predictability of physiological linkage. The order of conversation topics and mother/daughter's conversation turn were counter balanced across dyads. After each baseline and conversation turn TESI, VAS and TSM were completed. Therefore, each participant completed each of these measures nine times throughout the experiment. The physiological recordings were stopped while the participants were completing these measures.

Design

The strength of physiological linkage. A mixed (within-subject and between-group) repeated measures design was used to examine the hypotheses that

the physiology of the listener would follow that of the speaker (3.2), the physiological linkage occur and would increase from the neutral to pleasant interactions and be highest for the conflictual interaction (3.3), and the physiological linkage would be greater for the high-conflict group than the low-conflict group (3.4). The between-group factor was Conflict (high and low conflict). Within-subject factors were, Lead (baseline, mother lead and daughter lead), Predict (mother predict and daughter predict) and Topic (neutral, conflictual and pleasant). It is necessary to explain that Lead describes the experimental condition but predict indicates the direction of the predicability of physiological linkage derived via the bivariate time-series analysis. For each of the physiological measures (i.e., HR and FPA), the only dependent variable was the strength of physiological linkage, that is the linkage score (z-score) regardless of its statistical significance and direction (mother/daughter predict).

The Williams and Gottman (1982) time-series analysis program provided z-score outputs for each analysis of paired data for each mother-daughter dyad (definitions and computations of different measures of physiological linkage are included in the Data Scoring section). These scores are described as the strength of physiological linkage which include all bivariate physiological linkage scores irrespective of whether they were significantly related or not (the bivariate scores for significant physiological linkage will be described in the Data Scoring section).

Predictors of physiological linkage. The last part of this experiment involved a correlational study examining the predictor variables of the strength of physiological linkage (the criterion variables) among different measures of

metamotivational states and emotions and testing the hypothesis that the levels of felt arousal would be associated with the strength of physiological linkage (hypothesis 3.1). The criterion variables comprised the strength of physiological linkage for HR and FPA, an overall index (combining HR and FPA) and seven indices of physiological linkage during mother lead, daughter lead, mother predict and daughter predict and for each conversation topic. The definitions and computations of the criterion variables will be presented in the Data Analyses section.

Data Scoring

Physiological linkage (physiological data reduction and the preliminary analysis of bivariate data). Physiological data reduction and preliminary bivariate analysis generally followed the bivariate techniques described by Gottman and Levenson (1983). These techniques involved the computation of residualised change scores for each physiological variable. The use of residualised change scores provides protection from initial-value dependency in the data (operation of the Law Initial-Values, for more details, see O'Mara, 2001). This procedure yielded three types of data sets.

For each of the two physiological measures (HR and FPA, due to the above-mentioned measurement problem, SCL data was not scored), sequential 5 second averages (data set 1) were computed for each member of each dyad on all baseline and conversation segments. From data set 1, baseline means and standard deviations were calculated for each member of each dyad (mother/daughter), and these were used to compute *z*-scores (data set 2) for each member of each dyad during each

conversation segment (mother lead, daughter lead) of each conversation topic. Data set 2 comprised normalized data which reflected the physiological changes from the baseline mean (as a basis for comparison) to each conversation segment for each member of each dyad. In this way, the sequential data for each member of each dyad during each 8-minute conversation segment were normalised. This resulted in two pairs (one pair for mother and the other pair for daughter) of normalised data subset for each physiological variable in each conversation. For example, in the pleasant conversation, one subset of data set 2 resulted from the mother leading the conversation and the daughter listening to her and the second subset of data resulted from the daughter leading and mother listening to her. For the purpose of clarity, it is important to note that physiological linkage is a dyadic phenomenon. That is, the data belongs to dyads, and the final linkage data (data set 3) does not indicate separate data for mothers and for daughters (in contrast with the individual physiological responding in Experiment 2).

Data set 3 comprised *z*-scores indicating the level and direction of physiological linkage between mother and daughter (physiological linkage scores). The Williams and Gottman (1982) bivariate time-series analysis program was used to analyse each subset of paired data (subsets of data set 2). This analysis provided a measure of how well the physiological response of each member of each dyad predicted the other member's response pattern (i.e., physiological linkage). This resulted in two subsets of data comprising four pairs (two pairs for each of the physiological variables, HR and FPA) of *z*-scores for each conversation segment (physiological linkage scores). One pair of linkage scores resulted from the mother leading the conversation and the other from the daughter leading the conversation.

Within each pair of linkage scores, one *z*-score indicated how well the mother's response pattern predicted the variance in the daughter's response pattern (controlling for the autocorrelation within the daughter's response pattern). The other *z*-score indicated how well the daughter's response pattern predicted the variance in mother's response pattern (controlling for the autocorrelation within the mother's response pattern).

Overall, the bivariate time series analysis yielded 4 *z*-scores (mother lead/mother predict, mother lead/daughter predict, daughter lead/daughter predict and daughter lead/mother predict) for each of the two physiological variables for each of the three conversation topics. Therefore, the data set 3 for each dyad comprised 24 numbers. The values of *z*-scores equal to or above 1.96 indicate that significant physiological linkage exists at the .05 level of significance.

Psychological measures. The scoring of the psychological measures (the TESI, TSM and VAS) were described in the previous experiment.

Data Analysis

Strength of physiological linkage. Descriptive statistics were used to calculate the percentage scores of significant mother predict and daughter predict physiological linkage in each segment of each conversation topic. For each of the two physiological responses, the strength of physiological linkage during turn-taking conversations were analyzed using a 2 (Conflict: Low-conflict/High-conflict) x 3 (Topic: Neutral, Conflictual, Pleasant), x 2 (Lead: Mother/Daughter) x 2 (Predict :

Mother/Daughter) repeated measures ANOVAs. For the purpose of clarity, it should be noted that, in Lead levels, the baseline is not mentioned because the baseline data was used as the reference to calculate the *z*-scores (data set 2) for each conversation segment. In other words, in contrast with Experiment 2, there is no data for baseline period included in the analysis. ANOVAs with Greenhouse-Geisser corrections for repeated measures, were employed to assess the change in dependent variable across all of the independent variables. The dependent variable was the strength of physiological linkage, that is all the *z*-scores irrespective of their direction (mother/daughter predict) and whether they were significantly related or not. ANOVA and t-tests were performed to identify the source of significant main effects or interactions as appropriate.

Predictors of the strength of physiological linkage. To examine the predictors of the strength of physiological linkage during mother-daughter dyadic interaction, separate series of stepwise multiple regression analyses were performed for mothers and daughters. It was necessary to perform a number of separate analyses on smaller numbers (subsets) of variables in order to achieve an acceptable ratio of variables to subjects (Tabachnick & Fidell, 1989). The analyses aimed to explore the contribution of metamotivational states, arousal, stress, hedonic tone and emotions to the strength of physiological linkage during dyadic interaction. For these analyses, a number of criterion variables were used. There were 10 criterion variables. Two separate indices of the strength of physiological linkage for HR and FPA were obtained by collapsing all bivariate scores across different lead (mother lead/daughter lead) and predict (mother predict/daughter predict) segments and conversation topics. There were three separate indices of physiological linkage for

each conversation topic. These indices were obtained by combining the four *z*-scores (including both FPA and HR scores) derived for each topic (mother lead/mother predict, mother lead/daughter predict, daughter lead/daughter predict and daughter lead/mother predict). An overall index was obtained by collapsing the data for HR and FPA. The correlates of an overall index of physiological linkage were examined in previous studies on shared physiology (Levenson & Gottman, 1983, 1985; O'Mara, 2001). Also, the bivariate scores for physiological linkage for HR and FPA for the three conversation topics were combined to yield four indices of physiological linkage for mother predict (the physiological pattern of mother predicts the response pattern of daughter), daughter predict, mother leads the conversation and daughter leads the conversation.

For each of the 10 criterion variables, seven groupings of predictor variables were examined for mothers and daughters respectively. The predictor variables were VAS scores for arousal, stress and hedonic tone (analysis 1); TSM scores for seriousness, planning ahead, felt arousal, preferred arousal and the total telic score (analysis 2); TESI ratings of stress for external factors, body stress, effort for external factors and effort for body stress (analysis 3); TESI ratings of relaxation, anxiety, boredom and excitement (analysis 4), TESI ratings of placidity, anger, provocativeness and sullenness (analysis 5); TESI ratings of pride, humiliation, modesty and shame (analysis 6); and TESI ratings of gratitude, resentment, virtue and guilt (analysis 7). For the physiological linkage during mother lead and daughter lead segments, the emotional ratings across mother lead (mother lead neutral, conflictual and pleasant) and daughter lead segments were collapsed and then used as the predictor variables. For the rest of criterion variables (i.e., the strength of physiological linkage for HR and FPA; neutral, conflictual and pleasant

conversations; mother predict and daughter predict) ratings of emotions were combined across baseline, mother lead and daughter lead segments to obtain the predictor variables. For the purpose of clarity, it should be noted that although there were no linkage scores for baseline period (physiological data during baseline was used to obtain normalized data for conversation segments), after each baseline, there were emotional ratings which were used in obtaining some of the predictor variables. Due to the sensitivity of multiple regression analysis to outliers, *z*-scores three standard deviations beyond the mean scores were replaced by the mean scores (see Tabachnick & Fidell, 1989). There were a total of 7 outliers.

Results

Physiological Linkage

The strength of physiological linkage during mother-daughter dyadic interaction. The results of ANOVAs on the strength of physiological linkage for HR and FPA were used to test the following hypotheses;

Hypothesis 3.2. The physiology of the listener would follow that of the speaker.

Hypothesis 3.3. The physiological linkage occur and would increase from the neutral to pleasant interactions and be highest for the conflictual interaction.

Hypothesis 3.4. The physiological linkage would be greater for the high-conflict group than the low-conflict group.

In the following ANOVAs, the main effects for topic and conflict will examine the differences in the strength of physiological linkage across topics (3.3), and between the two groups (3.4) respectively. The lead x predict interaction will be used to explore the hypothesis (3.2) that the physiology of the listener would follow

that of the speaker. The main effect for predict and other interactions will provide extra information regarding the strength of physiological linkage during mother-daughter interaction.

Among all the bivariate *z*-scores, 32 % indicate significant physiological linkage (16% for each of the lead segments; 17% for FPA and 15% for HR; 19% for daughter predict linkage and 13% for mother predict linkage; 16% for the low-conflict group and 16% for the high-conflict group). The breakdown across the neutral, conflictual and pleasant conversations was 29%, 36% and 31% respectively. Table 46 presents percentage scores of significant mother predict and daughter predict physiological linkage for HR and FPA during mother lead and daughter lead segments of each conversation topic for the combined, low-conflict and high-conflict groups. The percentages of significant physiological linkage are presented for the purpose (following Levenson & Ruef, 1992) of illustrating the extent and patterning of significant physiological linkages and are not analyzed further.

To examine the strength of physiological linkage, all the *z*-scores of bivariate time-series analyses were used irrespective of whether they were significant or not. Table 47 displays the mean scores and standard deviations of *z*-scores of daughter predict and mother predict physiological linkage for HR and FPA during the mother lead and daughter lead segments of each conversation topic for the low-conflict and high-conflict groups. The list of significant main effects and interactions for the ANOVAs on these *z*-scores are displayed in Table 48.

Table 46. *Percentage Scores of Significant Daughter Predict and Mother Predict Physiological Linkage for HR and FPA for the Combined, Low-conflict and High-conflict Groups during Mother Lead and Daughter Lead Segments of each Conversation Topic (N = 24 dyds)*

	Mother Lead the Conversation			Daughter Lead the Conversation		
Physiological Variables	Neutral	Conflictual	Pleasant	Neutral	Conflcitual	Pleasant
Combined Group						
HR -Daughter Predict	42.00	38.00	33.00	21.00	50.00	54.00
-Mother Predict	33.00	29.00	17.00	17.00	29.00	17.00
FPA -Daughter Predict	25.00	46.00	33.00	29.00	38.00	42.00
-Mother Predict	29.00	29.00	33.00	38.00	33.00	29.00
Low-conflict Group						
HR -Daughter Predict	17.00	13.00	25.00	0.00	17.00	25.00
-Mother Predict	4.00	13.00	8.00	8.00	17.00	0.00
FPA -Daughter Predict	17.00	17.00	25.00	4.00	8.00	25.00
-Mother Predict	8.00	17.00	17.00	21.00	21.00	17.00
High-conflict Group						
HR -Daughter Predict	25.00	25.00	8.00	21.00	33.00	29.00
-Mother Predict	29.00	17.00	8.00	8.00	13.00	4.00
FPA -Daughter Predict	8.00	29.00	8.00	25.00	29.00	17.00
-Mother Predict	21.00	17.00	17.00	17.00	13.00	13.00

Table 47. *Means and Standard Deviations of Mother Predict and Daughter Predict z- scores of Physiological Linkage for HR and FPA during Mother Lead and Daughter Lead Segments of each Conversation Topic for the Low-conflict and High-conflict Groups (N = 24 dyads)*

		Neutral Topic				Conflictual Topic				Pleasant Topic			
		Mother Lead		Daughter Lead		Mother Lead		Daughter Lead		Mother Lead		Daughter Lead	
Physiological Measures		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Low-conflict Group													
HR	-Mother Predict	0.78	0.78	0.72	0.81	1.56	1.76	1.13	1.10	1.06	0.79	0.72	0.72
	-Daughter Predict	1.54	1.71	0.44	0.62	1.33	1.15	1.38	1.90	2.13	1.79	2.08	1.39
FPA	-Mother Predict	0.98	1.13	1.39	0.99	1.26	1.46	1.27	1.58	1.53	1.65	1.31	2.07
	-Daughter Predict	1.37	1.90	0.86	1.34	1.37	1.89	0.68	1.27	2.20	2.47	1.48	1.50
High-conflict Group													
HR	-Mother Predict	1.31	1.30	0.73	0.96	1.83	1.58	1.22	1.53	0.97	1.06	0.37	0.47
	-Daughter Predict	1.56	1.12	1.40	1.21	1.33	1.19	2.13	1.24	0.74	0.97	2.24	1.47
FPA	-Mother Predict	1.73	1.27	1.76	1.86	1.46	1.97	1.00	1.36	1.20	1.27	0.99	1.16
	-Daughter Predict	1.24	1.05	1.37	1.13	2.94	2.03	1.52	1.22	0.91	1.92	1.41	2.06

Table 48. *The List of Signficant Main Effects and Interactions for the ANOVAs on the Strength of Physiological Linkage for HR and FPA (N = 24 dyads)*

Physiogical Measures	Significant Main Effects and Interactions	*F*	df	*p*
HR	Predict	7.61	1, 22	.011
	Lead x Predict	4.63	1, 22	.043
	Lead x Predict x Topic	3.45	1.94, 42.47	.042
	Lead x Predict x Conflict	6.43	1, 22	.019
FPA	Topic x Conflict	4.19	1.66, 36.48	.029

Note. Degrees of freedom are based on the Greenhouse-Geisser corrections for repeated measures.

From Table 48, it can be seen that the ANOVA on the strength of physiological linkage of HR yielded a main effect for predict but not for lead, topic or conflict. The HR of daughters (M = 1.53, SD = 0.67) predicted the HR of mothers significantly better than vice versa (M = 1.04, SD = 0.49). The strongest physiological linkage during the conflictual conversation was a non-significant trend, F (1.85, 40.69) = 3.14, p = .068. There were significant interactions for lead x predict, (Figure 22), lead x predict x topic (Figure 23), and lead x predict x conflict (Figure 24).

To interpret the lead x predict interaction, t-tests were performed and showed that, when daughters led the conversation, the HR of daughters predicted the HR of mothers significantly better than vice versa (M = 1.61, SD = 0.84; M = 0.82, SD = 0.48), t (23) = 3.72, p = .001, also, when mothers led the conversation, their HR predicted the HR of daughters significantly better than when daughters led the conversation (M = 1.25, SD = 0.77; M = 0.82, SD = 0.48), t (23) = -2.55, p = .018.

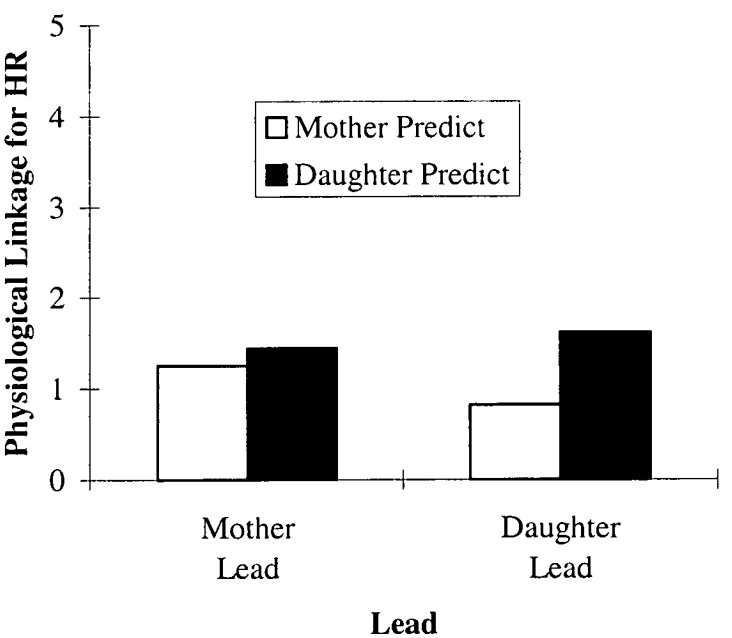

Figure 22. The Mean Scores of Daughter Predict and Mother Predict Physiological Linkage for HR during the Mother Lead and Daughter Lead Segments.

To interpret the lead x topic x predict interaction, separate 2 x 2 (lead x predict) ANOVAs were conducted on each topic. For the ANOVA on the neutral conversation, a main effect occurred for lead, F (1, 23) = 4.63, p = .042, but not for predict. There was no significant interaction. During the neutral conversation, the physiological linkage of HR was greater when mother led the conversation (M = 1.31, SD = 0.96) than when daughters led the conversation (M = 0.83, SD = 0.64). The ANOVA on the conflictual conversation did not yield any significant main effects or interactions. The ANOVA on the pleasant conversation yielded a main effect for predict, F (1, 23) = 15.54, p = .001, but not for lead. There was a significant interaction for lead x predict, F (1, 23) = 5.93, p = .023. During the pleasant conversation, the HR of daughters predicted the HR of mothers significantly better than vice versa (M = 1.80, SD = 1.09; M = 0.79, SD = 0.60). To interpret the lead x predict interaction, t-tests were used and revealed that, when daughters led the pleasant conversation, the HR of daughters predicted the HR of mothers significantly better than vice versa (M = 2.16, SD = 1.40; M = 0.57, SD = 0.63), t (23) = 5.11, $p <$ .001; also, when mothers led the pleasant conversation, their HR predicted the HR of daughters significantly better than when daughters led the conversation (M = 1.01, SD = 0.91; M = 0.57, SD = 0.63), t (23) = -2.13, p = .044.

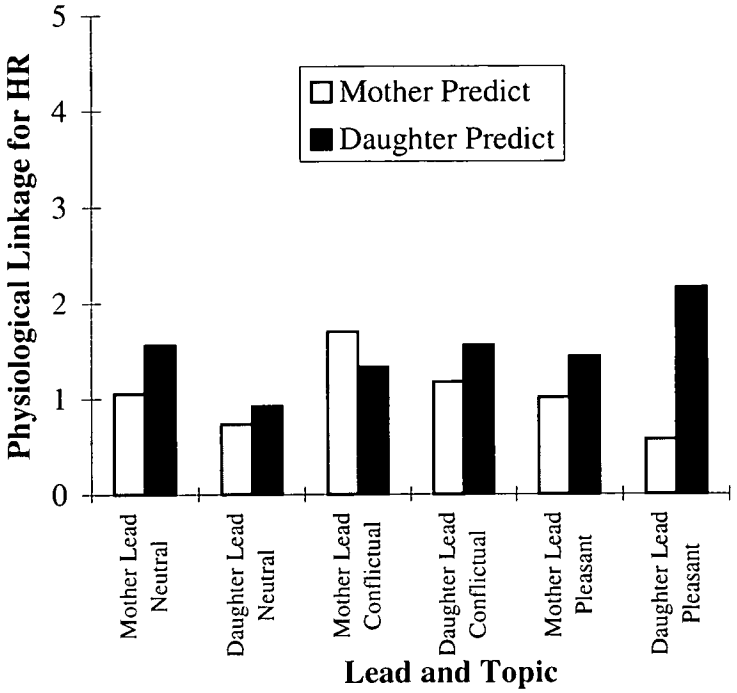

Figure 23. Mean Scores of Mother Predict and Daughter Predict Physiological Linkage of HR during the Mother Lead and Daughter Lead Segments of each Conversation Topic.

To interpret the lead x predict x conflict interaction, a separate 2 x 2 (lead x conflict) ANOVA was conducted for each predict segment. The ANOVA on mother predict segment yielded a main effect for lead, F (1, 22) = 6.49, p = .018 (means were given earlier) but not for conflict. There was no significant interaction. The ANOVA on the daughter predict segment did not yield any main effects but there was a significant interaction for lead x conflict, F (1, 22) = 7.04, p = .015. To interpret the interaction, t-tests were performed and showed that, when daughters led the conversation, the daughter predict physiological linkage of HR was greater for the high-conflict group (M = 1.92, SD = 0.87) than the low-conflict group (M = 1.30, SD = 0.71) but the difference failed to reach significance, t (22) = -1.93, p = .067. Thus, the lead x conflict interaction meant that, for the high-conflict group, when daughters led the conversation, the HR of daughters predicted the HR of mothers significantly

better than when mothers led the conversation (M = 1.92, SD = 0.87; M = 1.22, SD = 0.74), t (1) = 3.06, p = .011.

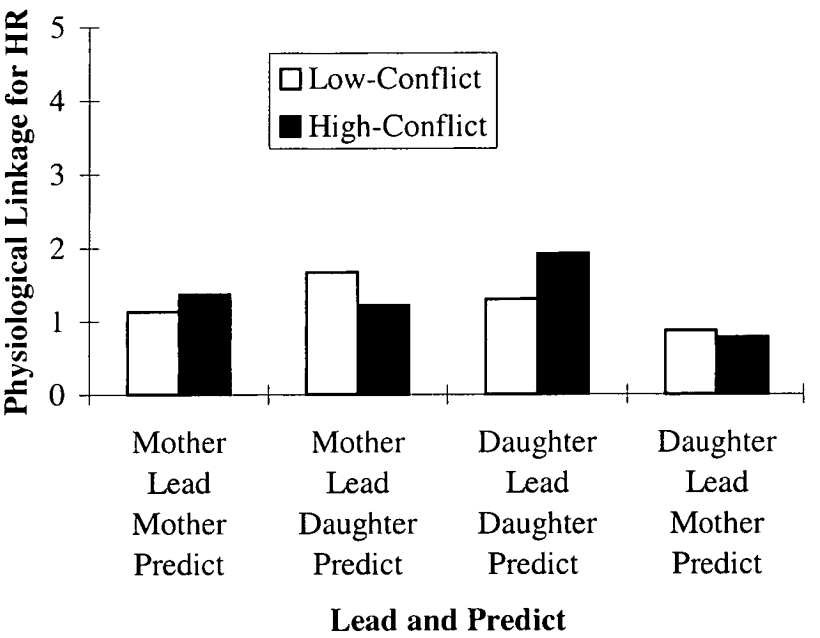

Figure 24. Mean Scores of Mother Predict and Daughter Predict Physiological Linkage of HR for the Low-Conflict and High-Conflict Groups during the Mother Lead and Daughter Lead Segments.

The ANOVA on the strength of physiological linkage for FPA did not yield any main effects. There was a significant interaction for topic x conflict, F (1.66, 36.48) = 4.19, p = .029, and means are graphed in Figure 25. t-tests showed that, for the high-conflict group, physiological linkage was significantly greater for the conflictual conversation (M = 1.73, SD = 0.65) than the pleasant conversation (M = 1.13, SD = 0.97), t (11) = 2.23, p = .048.

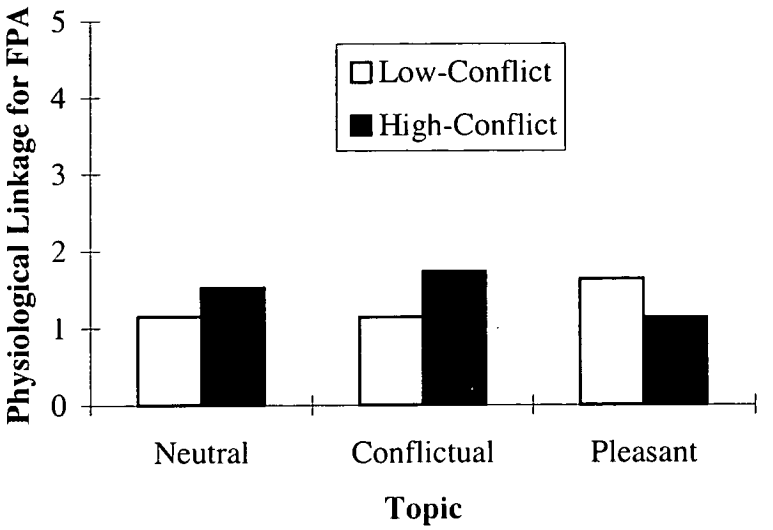

Figure 25. The Mean Scores of Mother Predict and Daughter Predict Physiological Linkage of FPA for the Low-Conflict and High-Conflict groups during the Neutral, Conflictual and Pleasant Conversations.

Summary. The ANOVAs on HR and FPA did not support the hypothesis (3.4) that the physiological linkage would be greater for the high-conflict group than the low-conflict group. However, for the ANOVA on FPA linkage, the topic x conflict yielded significant differences which were exclusive to the high-conflict group. For this group, the physiological linkage was stronger during the conflicutal conversation than the pleasant conversation. The lead x predict interaction for the ANOVA on the strength of physiological linkage for HR provided partial support for the hypothesis (3.2) that the physiology of the listener would follow that of the speaker. When daughters led the conversation, their HR predicted the response pattern of mothers significantly better than vice versa. Also, when mothers led the conversation their HR predicted their daughters' response pattern significantly better than when daughters led the conversation. Also, the lead x predict x conflict interaction showed that, only for the high-conflict group, when daughters led the conversation, the HR of daughters predicted the HR of mothers significantly better than when mothers led the

conversation. The ANOVA on FPA did not confirm the second hypothesis (3.2) regarding the impact of listening on the direction of physiological linkage during mother-daughter interaction. The ANOVAs on physiological linkage for HR and FPA did not support the hypothesis (3.3) that the physiological linkage occur and would increase from the neutral to pleasant interactions and be highest for the conflictual interaction. For the ANOVA on HR linkage, the main effect for predict revealed that physiological linkage was stronger when the HR of daughters predicted the response pattern of mothers than vice versa.

Predictors of the Strength of Physiological Linkage

This subsection of the data analyses explored the hypothesis (3.1) that the levels of felt arousal would be associated with the strength of physiological linkage. The results of ten series of stepwise multiple regression analyses were used to examine the predictors of the strength of physiological linkage during mother-daughter interaction. Table 49 presents the significant predictors of the strength of the physiological linkage during mother-daughter interaction.

The first series of analyses used the strength of physiological linkage for HR as the criterion variable. From Table 49, the multiple regression analyses revealed that the stronger physiological linkage for HR was associated with higher levels of daughters' felt arousal (15%) and mothers' sullenness (24%) and virtue (22%) and lower levels of preferred arousal (18%) and humiliation (17%) of daughters.

Table 49. *Summary of the Stepwise Multiple Regression Analyses Listing the Predictor Variables of the Strength of Physiological Linkage for HR and FPA; during each Conversation Topic; and Daughter Predict, Mother Predict, Mother Lead and Daughter Lead Segments (N = 24 dyads)*

Criterion Variables	Predictor Variables	*Beta*	R^2 *Change*	*F Change*	*df*	*Sig F Change*
1. HR Index	Daughters' Felt Arousal	0.44	0.15	4.63	1, 21	.043
	Daughters' Preferred Arousal	-0.62	0.18	4.69	1, 22	.042
	Mothers' Sullenness	0.49	0.24	6.91	1, 22	.015
	Daughters' Humiliation	-0.41	0.17	4.52	1, 22	.045
	Mothers' Virtue	0.47	0.22	6.12	1, 22	.022
2. FPA Index	Daughters' Preferred Arousal	0.54	0.29	8.99	1, 22	.007
3. Topic Index	Nil					
4. Conflictual Topic Index	Daughters' Effort : External factors	0.44	0.20	5.35	1, 22	.031
	Mothers' Gratitude	0.46	0.21	5.81	1, 22	.025
5. Pleasant Topic Index	Daughters' Total Telic Score	-0.43	0.18	4.94	1, 22	.037
6. Overall Index	Nil					
7. Mother Predict Index	Nil					
8. Daughter Predict Index	Daughters' Placidity	-0.53	0.28	8.47	1,22	.008
9. Mother Lead Index	Daughters' Pride	-0.46	0.21	5.98	1,22	.023
	Daughters' Virtue	-0.41	0.17	4.43	1, 22	.047
10. Daughter Lead Index	Daughters' Arousal	0.41	0.17	4.48	1, 22	.046
	Daughters' Felt Arousal	0.42	0.18	4.74	1, 22	.041
	Daughters' Provocativeness	0.45	0.20	5.63	1, 22	.027

The second series of analyses used the strength of physiological linkage for FPA as the criterion variable. For these analyses, the only significant predictor variable for FPA was higher levels of preferred arousal for daughters (29%).

For the third series of analyses on the physiological linkage for the neutral topic, there were no significant predictors. For the fourth series of analyses on conflictual topic, the only significant predictors of the strength of physiological linkage were greater levels of effort for external factors of daughters (20%) and gratitude of mothers (21%). In the fifth series of analyses on pleasant conversation, stronger physiological linkage was related to lower levels of total telic scores of daughters (18%).

The sixth and seventh series of analyses used overall index of the strength of physiological linkage and mother predict physiological linkage as the criterion variables respectively. These analyses yielded no significant predictor variables. The eighth series of analyses using daughter predict physiological linkage as the criterion variable found a single predictor which was lower levels of placidity for daughters (28%).

For the mother lead segment (the ninth series), there were two significant predictors: stronger physiological linkage was associated with lower levels of pride (21%) and virtue (17%) of daughters.

For the tenth series of analyses using the daughter lead criterion, the analyses showed that when daughters led the conversation, stronger physiological linkage was associated with higher levels of VAS rating of arousal (17%), felt arousal (18%) and provocativeness (20%) for daughters.

Summary. The results of stepwise multiple regression analyses provided partial support for the prediction (3.1) that the levels of felt arousal would be associated with the strength of physiological linkage during mother-daughter dyadic interaction. The levels of felt arousal of daughters were associated with the strength of physiological linkage for HR. Also, the levels of preferred arousal of daughters were associated with the strength of physiological linkage for both HR and FPA. The index of HR linkage and other indices of physiological linkage (averages of FPA and HR linkage) for each topic and for each lead or predict segments yielded some significant predictors among different measures of tension/effort stress from body and external factors, the telic state, and the somatic and transaction emotions. A greater number of significant predictors emerged from the daughters' ratings than from those of mothers.

Discussion

Experiment 3 examined physiological linkage in the low-conflict and high-conflict mother-daughter dyads during neutral, conflictual and conversation topics. This experiment also explored the emotional and metamotivational predictors of physiological linkage between mothers and daughters. In this regard, the following hypotheses were made;

Hypotheses 3.1: The Physiological Linkage would be Associated with the Levels of Felt Arousal

The results of multiple regression analyses regarding the predictors of the strength of physiological linkage were used to test this hypothesis. In this respect, the findings

partially supported this prediction. However, the results across the two physiological measures were not consistent.

For FPA, higher preferred arousal of daughters was associated with stronger physiological linkage between mothers and daughters. As higher levels of preferred arousal indicates the paratelic metamotivational state, it is the daughters' paratelic state which predicts the strength of physiological linkage for FPA.

For HR, stronger physiological linkage was associated with lower level of preferred arousal of daughters and higher levels of daughters' felt arousal and humiliation, and with mothers' sullenness and virtue. The positive association between daughters' felt arousal and the strength of physiological linkage for HR shows that when daughters felt low arousal, the mother and daughter were more physiologically disengaged. While the predictive direction of lower preferred arousal of daughters for stronger physiological linkage for HR appears to be opposite to the findings on FPA; this apparent contradiction most likely reflects the different directions of the arousal responses: high physiological arousal is indexed by HR increases and by FPA vasoconstriction or decreases (Brownley et al., 2000). The positive associations between stronger physiological linkage for HR and daughters' higher levels of felt arousal and lower levels of preferred arousal shows that higher levels of tension stress (the discrepancy between the felt and preferred levels of arousal) for daughters give rise to stronger physiological linkage for HR. Also, the emergence of mothers' sullenness as a predictor of stronger physiological linkage of HR indicates that when mothers are experiencing unpleasant low-arousal emotions the physiological linkage becomes stronger. The inverse association between humiliation felt by daughters and the strength of physiological linkage for HR implies that the experience of humiliation for daughters decreases the strength of physiological linkage between mothers and daughters and it is

likely that the daughters' humiliation is an effect of the absence of empathic listening and perspective taking by mothers (Levenson & Ruef, 1992; O'Mara, 2001). Overall, the predictors of the strength of physiological linkage for daughters shows that shared physiology between mothers and daughters could be weaker when daughters feel low levels of arousal even though they prefer the higher levels of arousal and experience negative emotions. Also, the relationship between greater virtue of mothers and stronger physiological linkage for HR shows that mothers and daughters are more likely to respond to the physiology of each other when mothers obtain transactional gain in an alloic-sympathy state (virtue).

On the whole, the series of multiple regression analyses on HR and FPA have several implications. First, various emotional and metamotivational variables could be related to the level of physiological linkage for each of the physiological variables. It should be noted that some of these disparate effects are most likely due to the fact that different conflict groups and different conversations were combined for each of the indices of HR and FPA. Also, a greater number of somatic and transactional emotions are significantly related to HR linkage rather than to FPA linkage.

The results of the analyses on the three conversations shows that none of the measures of metamotivational states and emotions are correlated with the strength of physiological linkage during the neutral conversation. The emergence of the total telic score of daughters as the predictor of weaker physiological linkage during the pleasant conversation suggests that mothers and daughters are more physiologically engaged in a pleasant context when daughters are in a paratelic state than when they experience the telic state. For the conflictual conversation, the positive relationship between effort-stress from external factors of daughters and the strength of physiological linkage implies that, in a conflictual context, this kind of effort-stress could give rise to the level of

shared physiology, and might be a part of "the sense of being locked into the conflictual interaction and unable to step back" (Levenson & Gottman, 1983, p. 596). However, the predictive value of higher levels of gratitude for mothers indicate that, in an unpleasant context, the experience of transactional gain could increase the extent to which mothers attend to and respond to the physiology of their daughters. Also, the predictive values of daughters' effort-stress and mothers' gratitude might be due to extra effort of daughters to contribute (positively) to the conflictual conversation and mothers' gratitude and appreciation of their daughters' efforts.

Although the multiple regression analyses exploring the predictors of an overall index and mother predict physiological linkage did not yield any significant results, significant predictors emerged from the analyses on the strength of daughter predict, daughter lead and mother lead physiological linkage. When daughters' physiology predicted the mothers' physiological responses, daughters' placidity was a substantial predictor (28% of variance) of the weaker physiological linkage between mothers and daughters. This finding indicates that, for daughters, low felt arousal in the telic/negativistic state (higher hedonic tone in this state) was negatively associated with the extent to which their physiology predicted the mothers' response.

When mothers led the conversations, lower levels of pride and virtue of daughters were the significant predictors of stronger physiological linkage respectively. Pride is an autic-mastery emotion reflecting the concentration on one's qualities and positive aspects. It is likely that the autic-mastery state for the individual indicates the detachment phenomenological frame (Apter, 1993) which acts as an insulator from the emotional and physiological responses of the other party and a barrier to shared physiology. In other words, full concentration on control and self could attenuate awareness of the emotional experience and physiological reactions of the individual with

whom one is interacting. However, an explanation of the inverse association between daughters' virtue and the strength of physiological linkage is not obvious. On the whole, the data on the predictors of mother lead physiological linkage demonstrates that when the mother leads the conversation, higher level of transactional gain could decrease the strength of shared physiology. In this respect, it is useful to explore the cognitive and behavioural aspects (both verbal and facial) of the conversation which are related to transactional gain in the forms of virtue and pride.

The results showed that when daughters led the conversations daughters' arousal, daughters' felt arousal and daughters' provocativeness emerged as the significant predictors of stronger physiological linkage between mothers and daughters. These findings implies that higher levels of felt arousal and hedonic tone in the paratelic/negativistic state (provocativeness) for daughters give rise to the physiological linkage via increasing the intensity and communication of physiological responses which daughters expressed during their turn of conversation.

Overall, the findings regarding the predictors of the strength of physiological linkage between mothers and daughters has several implications. First, the predictors of physiological linkage of each physiological measure are the emotional and metamotivational correlates of physiological arousal for that measure. Second, low hedonic tone in the telic state (lower placidity) and high hedonic tone in the paratelic state (higher provocativeness) for daughters are related to stronger physiological linkage. Third, physiological linkage is positively associated with mothers' transactional emotions but negatively associated with daughters' transactional emotions.

Hypothesis 3.2: The Physiology of the Listener would Follow the Story Teller

The results of the ANOVAs on the strength of physiological linkage for HR and FPA were used to examine this hypothesis. With respect to this prediction, the results for the two physiological variables regarding the lead x predict interaction were not consistent. Although the findings for FPA regarding the strength of physiological linkage did not support the hypothesis, for HR, the post hoc analyses for lead x predict interaction confirmed the predicted directions. When daughters led the conversations, their HR predicted the HR of mothers more strongly than vice versa. Also, when mothers led the conversation, their HR predicted the HR of daughters more strongly than when daughters led the conversations. These outcomes are consistent with O'Mara's (2001) finding that the physiology of the person leading the conversation predicted the physiology of the person listening. However, there was an unexpected outcome. The main effect for predict indicates that the HR of daughters predicted the HR of mothers more strongly than vice versa. This outcome is consistent with Wagner and Calam's (1988) results of their pilot study on parent-child dyads. O'Mara (2001) commented that the physiological linkage in Levenson and Gottman's (1983) study on married couples, in the absence of turn-taking conversations, could be an indicator of affective dominance. The current study attempted to overcome affective dominance by arranging turn-taking conversations. Thus, the data suggests that, in spite of these arrangements, daughters were affectively dominant during the conversations. The interpretation is in line with the prominence of daughters' emotions in accounting for the strength of physiological linkage (see Table 49).

The inconsistency in results regarding the impact of listening on the physiological linkage across the two physiological measures makes the integration of

data difficult. It remains uncertain, as to why the results regarding the strength of physiological linkage for FPA did not yield significant findings. It is likely that FPA was not a reliable measure, and it is possible that HR is different as it is controlled by both sympathetic and parasympathetic nervous systems whereas FPA is under the control of only sympathetic nervous system.

Hypothesis 3.3: The Physiological Linkage would Occur and Increase from the Neutral to the Pleasant Conversation and be the Highest for the Conflictual Conversation

The results of the ANOVAs regarding the impact of conversation topic on the strength of physiological linkage were used to examine this prediction. The findings on HR and FPA did not support the hypothesis. Significant levels of physiological linkage occurred during the neutral, conflictual and pleasant conversations. However, there were no significant differences in the strength of physiological linkage across the three conversation topics. For HR, there was a non-significant trend in that the strength of physiological linkage was greater during the conflictual conversation than the pleasant or neutral conversation. The lack of significant differences in the strength of physiological linkage across the three conversation topics is consistent with the finding of previous studies (Levenson & Gottman, 1983; Wagner and Calam, 1988; O'Mara, 2001) regarding the equivalent level of physiological linkage across different types of conversation topics.

Hypothesis 3.4: The Physiological Linkage would be Greater for the High-conflict Group than the Low-conflict Group

The ANOVAs on the strength of physiological linkage for each of the physiological measures did not confirm the hypothesis. Although the ANOVAs on FPA and HR did not produce a main effect for conflict, during the conflictual conversation, the non-significant trend for the strength of physiological linkage for FPA was in the predicted direction. Also, the topic x conflict interaction for the ANOVA on FPA produced an unexpected outcome. For the high-conflict group, physiological linkage for FPA was significantly stronger during the conflictual conversation than the pleasant conversation. This outcome supports the Levenson and Gottman's (1983) finding that physiological linkage during a conflictual segment was predictive of 59% of marital satisfaction for distressed couples. The finding suggests that the high-conflict mother-daughter dyads are more likely to follow the physiological pattern of each other during the conflictual conversation than the pleasant conversation. This interpretation contrasts with a non-significant trend that, for the low-conflict group, physiological linkage was stronger during the pleasant conversation than the conflictual conversation.

Overall, the data regarding the group differences in the strength of physiological linkage for FPA indicated that the two groups differ in terms of the interactional context within which they are physiologically connected to each other. According to Levenson and Ruef (1992), rating accuracy of negative affect or perspective taking was found to be associated with the level of physiological linkage. Furthermore, Hoffman (1990) maintained that shared feeling could occur, in addition to perspective taking, via the involuntary modes of emotional contagion, imitation or conditioning. Here, it is suggested that, for the high-conflict group, a history of frequent arguments and confrontations exposed mothers and daughters to contagion, conditioning or imitation of

the negative affects and to the physiological responses of each other. Levenson and Ruef (1992) did not find an association between the rating accuracy of positive affect and physiological linkage and this could be due to the lack of a pleasant conversation. The impact of conflictual conversation on the strength of physiological linkage for the high-conflict group has implications for counselling which should help problematic families interact emotionally and physiologically in the neutral and pleasant contexts.

Conclusion

The findings regarding physiological linkage between mothers and daughters have several implications. It was hypothesized (3.1) that the strength of physiological linkage would be associated with the levels of felt arousal. The hypothesis was partially upheld. The results regarding the emotional and metamotivational predictors of physiological linkage differentiate the two physiological measures in terms of the strength of physiological linkage between mothers and daughters. While the predictors of the strength of physiological linkage for FPA are limited to preferred arousal, strength of physiological linkage for HR was found to be related to changes in felt arousal, preferred arousal and somatic and transactional emotions. Also, daughters' emotions and metamotivational states emerged as the predictors of physiological linkage more than those of mothers.

The hypothesis (3.2) that physiology of the listener would follow the speaker was supported only by the results of the ANOVA on HR. Also, the main effect for predict provided additional information in that the physiological linkage was stronger when the physiology of daughters predicted the response pattern of mothers. Given the importance of daughters' emotions as the predictors of physiological linkage, the impact of

daughters' on the direction and strength of physiological linkage between mothers and daughters requires further exploration.

The hypothesis (3.3) that physiological linkage would occur and increase from the neutral to the pleasant conversation and be the highest for the conflictual conversation was not supported by the ANOVAs on HR and FPA. There were no differences in the strength of physiological linkage across the three conversation topics. It is likely that to achieve significant differences in physiological linkage across conversation topics, more intense interactional contexts are required than those used in this study.

The hypothesis (3.4) that the physiological linkage would be greater for the high-conflict group than the low-conflict group was not supported by the finding of this experiment. However, the ANOVA on FPA showed that, the two groups differ in terms of the interactional context within which they exhibit stronger shared physiology. In other words, while the strength of physiological linkage for the low-conflict group did not differ across the conversation topics, the high-conflict group exhibited stronger physiological linkage during the conflictual conversation and weaker physiological linkage during the pleasant conversation. These findings indicates that the quality of relationship could determine the context within which the dyads are more likely to experience shared physiology.

Overall, this experiment demonstrated the value of reversal theory constructs and methodology in advancing the knowledge of physiological linkage during dyadic interaction. The use of reversal theory constructs and measures of emotions as predictors of the physiological linkage revealed the importance of metamotivational states as the predictors of the strength and direction of physiological linkage between members of dyads. The findings also reflect the importance of the conflictual interaction for the

stronger physiological linkage in high-conflict dyads. It should be noted that the sample size and its composition indicate the need for caution in generalizing the findings to other populations. Replication of the study on larger and more varied samples would be useful to increase the statistical power and reliability of the findings. Future research, including the use of other family dyads could complement the current knowledge in the area of shared physiology for dyads.

Chapter 6

General Discussion

Chapter 6

General Discussion

This thesis describes the application of reversal theory measures and concepts in an examination of emotional and psychophysiological processes in mother-daughter dyads. The thesis consisted of three experiments. Experiment 1 explored the emotional processes during neutral, conflictual and pleasant conversations and sought to identify predictors of family conflict. Experiment 2 also investigated the effects of neutral, conflictual and pleasant conversations and had the additional aim of comparing the emotional and physiological processes in low-conflict and high-conflict mother-daughter dyads. The third experiment investigated the extent of physiological linkage in low-conflict and high-conflict mother-daughter dyads and identified the emotional predictors of the physiological linkage. The three experiments demonstrated the value of reversal theory as a theoretical framework for the investigation of emotional and physiological processes that occur during dyadic interaction, and extended the empirical data regarding the emotional aspects of mother-daughter relationships. In this regard, the current findings complemented and extended the previous knowledge regarding the mother-daughter and group differences in metamotivational styles, emotional experience, psychophysiological responding and the interplay between the individual, dyadic and contextual factors.

Motivational Style Profiles

The motivational style profiles (MSP scores) of mothers and daughters showed similarities in orientation towards being serious, conformist and sympathetic. Significant mother-daughter differences in seriousness, arousal avoiding and

compliance dominance provided partial support for the hypothesis (1.4) that daughters would be more paratelic and negativistic dominant than mothers. These mother-daughter differences were consistent with the previous data regarding the developmental trends in metamotivational dominance (McDermott,1988a; Murgatroyd, 1985b; O'Connor, 1992). Also, the data advanced the previous findings by suggesting that mothers were more autic-mastery dominant and pessimistic than daughters. The finding that serious-playful salience for mothers along with their individual tendencies towards pessimism were associated with lower and higher level of perceived conflict in the family environment was an indication of the capacity of reversal theory measures of motivational styles to account for some of the dynamics in the family environment. Moreover, the results revealed mother-daughter differences which were exclusive to the high-conflict group. In this group, daughters were more arousal-seeking and more negativistic dominant than their mothers. Despite the fact that the associations between the motivational styles and different measures of emotional experience were not examined, the mother-daughter and group differences in metamotivational dominance, salience and individual tendencies provided information, in the light of which, the results regarding the emotional and physiological processes in mother-daughter dyads could be better understood. In addition to dominance, perceived conflict in the family environment indicated another aspect of mother-daughter and group differences which will be described in the following section.

Predictors of Perceived Conflict in the Family Environment

The first part of Experiment 1 examined the predictors of the level of perceived conflict in the family as the between-group variable for Experiments 2 and

3. The findings of stepwise multiple regression analyses revealed that, although the level of perceived conflict in the family was not significantly different for mothers and daughters, mothers' responses were shown to be the stronger predictors of the level of conflict in the family. Mothers' reports of the levels of anger-intensity x frequency of conflict issues (hypothesis1.2), parenting stress (hypothesis 1.1), conflict resolution skills (hypothesis 1.1), pessimism and playful-serious salience and hostility emerged as significant predictors of perceived conflict in the family. Also, the predictive value of paranoid ideation for daughters indicated the relationship between the levels of parent-adolescent conflict and psychological health of daughters. Further, the emergence of perceived organization and control for dyads (average of mother's and daughter's scores for each dyads) as the predictors of perceived conflict is an indication of how different factors in the family environment are intertwined to generate a specific atmosphere in each family (hypothesis 1.2). Implicit in these data is the fact that the perceived conflict between parent and adolescent is not well understood or changed unless the impact of these predictors are put into perspective. The findings in this section confirmed the validity of perceived conflict in the family in distinguishing the two groups of low-conflict and high-conflict mother-daughter dyads. Mother-daughter and group differences in motivational styles and perceived conflict in the family can form the basis upon which the emotional and psychophysiological processes in dyadic interaction are examined and explained. Longitudinal studies could be used to examine the degree to which individuals or dyads, as inconsistent agents, change across time in terms of their motivational styles and perceptions of conflict in the family. The results of the three experiments regarding the emotional processes in mother-daughter dyads demonstrate how the mother-daughter differences in metamotivational dominance

and group differences in perceived conflict are relevant to the pattern of emotional experience for mothers and daughters.

Mother-Daughter Differences in Emotions and Metamotivational States

ANOVAs were used to examine mother-daughter differences in emotions and metamotivational states on ratings of the VAS, TESI and TSM. The hypothesis (1.4) regarding mother-daughter differences in the telic state was not supported by data. The data of Experiments 1 and 2 regarding the TSM revealed that mothers and daughters did not significantly differ in terms of seriousness, preferred arousal and the total telic score. However, there were unexpected mother-daughter differences in TESI ratings of emotions. During Experiments 1 and 2, daughters experienced greater levels of provocativeness and sullenness than did mothers suggesting the presence of a stronger paratelic/negativistic state for daughters than mothers. The presence of paratelic state for daughters is confirmed by the finding of Experiment 1 in that the level of boredom was greater for daughters than mothers. Furthermore, there were other unexpected mother-daughter differences in transactional emotions. These include the results of Experiments 1 and 2 which showed that mothers achieved greater levels of transactional gain than did daughters: Experiments 1 and 2 revealed that pride an autic-mastery emotion was greater for mothers than daughters, and a greater level of modesty for mothers was observed in Experiment 2. Furthermore, the data provided by Experiments 1 and 2 indicated that transactional loss in the form of resentment was greater for daughters than mothers.

On the whole, the mother-daughter differences in TESI ratings indicate that mothers and daughters differ as to their emotional response to the same conversations with daughters having the greater share of the paratelic state and unpleasant somatic

and transactional emotions and lower levels of pleasant transactional emotions. These outcomes are consistent with the findings of Experiment 1 regarding the metamotivational dominance in that daughters were more arousal-seeking and defiant dominant than mothers. However, the cognitive and behavioural factors that contribute to the emergence of particular metamotivational state for the members of dyads require further investigation. In this respect, the subjective experience of the individual and not the observer's appraisal should be the basis for exploration.

The Impact of the Conversation Topic on Emotions and Metamotivational States

Experiments 1 and 2 examined the effect of conversational context on emotional processes in mother-daughter dyads. The ratings of VAS, TESI and TSM were used to explore the impacts of conversation topics on emotions and metamotivational states. The nature of interaction in the these two experiments, being the face-to-face conversation or exposure to a recording of the previous conversation along with differences in sample size warrant caution in making general conclusions. However, in spite of these variations, similar patterns of data emerged from Experiments 1 and 2, and the differences in data were reasonably accounted for by both the metamotivational states and contextual distinctions. Jointly, the data from the first two experiments presented the overall impact of all conversations and comparison of the effects of the three conversation topics on emotional experience.

The overall impact of all conversations on emotions and metamotivational states. Given the focus of previous research on the conflictual aspects of the parent-adolescent relationship, no hypotheses was made regarding the overall impact of all conversations on emotional processes in mother-daughter dyads. However, the data

regarding the effects of all conversations were examined in order to elucidate the overall nature of emotional experience during the dyadic interaction. The data reported by Experiment 2 suggested that conversations increased the level of stress and VAS ratings of arousal and decreased the level of hedonic tone for mothers and daughters. Also, during the first experiment, conversations increased the level of felt arousal for mothers and daughters. The results showed that Experiment 2 was effective in decreasing the levels of seriousness for mothers and daughters and the total telic score for mothers and increasing the level of preferred arousal for daughters.

Collectively, the results of Experiments 1 and 2 showed that the conversations reduced the level of placidity and increased the levels of provocativeness and anger for mothers and daughters. Also, reduction in boredom and increase in excitement were found in Experiments 1 and 2 respectively. It is likely that these outcomes were due to an increase in the level of felt arousal for the participants.

The findings on transactional emotions indicate the unpleasant impact of the mother-daughter conversations on the emotions of mothers and daughters. The findings of the first two experiments revealed that resentment increased after the conversations. The data from Experiment 2 indicates a decrease in modesty and increases in shame and humiliation after the conversations. However, an increase in gratitude was reflected in the data of the first experiment. The increase in the level of gratitude in Experiment 1 shows that for the whole 63 dyads the conversations increased the level of transactional gain in an autic-sympathy state. The results of the second experiment showed that both reduction in transactional gain (modesty) and increases in transactional loss (shame and humiliation) were experienced.

Overall, the findings from Experiments 1 and 2 regarding the impact of conversations on reducing the levels of hedonic tone and transactional gain and increasing the levels of transactional loss for the participants does not reflect well on the quality of mother-daughter relationships. The results are consistent with Collins and Luebker (1994) who found that parent-adolescent relationships are characterized by a decrease in positive emotional exchange between parent and adolescent. The data also reflects the impact of the conversations on increasing the negativistic state of the participants. In addition to the overall effect of the conversations on emotions and metamotivational states, the first two experiments differentiated the three conversation topics in terms of their impact on emotional processes in mother-daughter dyads.

Comparison of the impacts of the three conversation topics on emotions and metamotivational states. Comparisons of the three conversation topics on emotions and metamotivational states were two-fold. First, the impact of each conversation on VAS, TSM and TESI ratings were examined. Second, the three conversations were compared in term of the level of each individual rating of VAS, TESI and TSM.

The prediction (1.5) regarding the minimal effect of the neutral conversation on emotions and telic/paratelic state was mostly upheld by the Experiments 1 and 2. However, in each experiment, the neutral conversation produced specific effects. During the first Experiment, the neutral conversation reduced the VAS rating of stress, and the TESI ratings of stress from the external factors and body stress for mothers and daughters. In Experiment 2, listening to the neutral conversation increased the level of felt arousal for the participants.

It was hypothesized (1.6) that the conflictual conversation would increase the levels of the telic state, stress, arousal, unpleasant emotions and reduce the levels of hedonic tone and pleasant emotions for mothers and daughters. The first two experiments mostly confirmed these hypotheses. Collectively, the results produced by Experiments 1 and 2 demonstrated the impact of the conflictual conversation on increases in the levels of VAS rating of stress, anger and reductions in the levels of VAS rating of hedonic tone, relaxation and placidity. Also, the findings of the first experiment indicated that the levels of effort-stress from external factors, total telic score, provocativeness and guilt increased after the conflictual conversation. The impact of the conversation on increases in sullenness and shame were exclusive to Experiment 2. The differences between the results of Experiments 1 and 2 could be related to the difference in sample size and statistical power between the first two experiments. Overall, the data revealed that the conflictual conversation can serve as a stressor and reduce the levels of pleasant somatic emotions and overall hedonic tone and increase the levels of stress, felt arousal, the telic state and unpleasant somatic and transactional emotions. However, the conflictual conversation can enhance hedonic tone in a paratelic/negativistic state (provocativeness).

It was hypothesized (1.7) that the pleasant conversation would increase the levels of hedonic tone, paratelic state and pleasant emotions and reduce the levels of stress and unpleasant negative emotions. The findings of the Experiments 1 and 2 partially supported the hypotheses. However, the impact of the pleasant conversation on emotional processes in mothers and daughters was most evident in Experiment 1. The data from Experiment 1 showed that the pleasant conversation increased the levels of preferred arousal, relaxation, excitement and gratitude and decreased the levels of seriousness, total telic score, body tension-stress, body effort-stress, and

anxiety indicating that the conversation reduced arousal and induced reversals to the paratelic state. The findings of Experiment 1 showed that the pleasant conversation increased hedonic tone in the conformist state (relaxation and excitement) and transactional gain in the autic-sympathy state (gratitude) and decreased the levels of telic state, and body tension-stress and effort stress. Also, in Experiment 2, listening to the same pleasant conversation only decreased the level of seriousness (a subscale of the TSM). The differences in the findings between Experiments 1 and 2 could be due to sample size or the possibility that for half of this sample, that is the low-conflict group, the pleasant conversation occurs so frequently that its effect is not unusual; and for the high-conflict group the quality of such an interaction is not strong enough to produce a significant effect.

It was predicted (1.8) that the levels of the telic state, stress, arousal and unpleasant emotions would be greater during the conflictual conversation than the neutral or pleasant conversation. The hypothesis was mostly upheld by the findings of the first two experiments. Collectively, the data provided by the Experiments 1 and 2 revealed that the levels of stress, seriousness, anger and shame were greater for the conflictual conversation than for the other two conversations. Also, the results of Experiment 1 showed that the levels of planning ahead, body stress, stress from external factors, effort for stress from external factors, effort for body stress and anxiety was greater during the conflictual conversation than the other two conversations. In Experiment 2, the highest levels of sullenness, resentment and guilt were found for the conflictual conversation. Collectively, the data provided by the first two experiments revealed that the levels of the telic state, stress, unpleasant somatic and transactional emotions was greater for the conflictual conversation than for the neutral or pleasant conversation. However, the results of Experiment 1

showed that boredom for daughters was greater during the neutral conversation than the pleasant or conflictual conversation. This outcome implies that the neutral nature of the conversation has lowered the level of hedonic tone and felt arousal in a paratelic/conformist state for daughters.

It was postulated (1.9) that the levels of hedonic tone, and pleasant somatic and transactional emotions would be greater for the pleasant conversation than the neutral or conflictual conversation. The findings provided by Experiments 1 and 2 partially supported this hypothesis. The results of the first two experiments indicated a greater level of VAS rating of hedonic tone during the pleasant conversation than the neutral or conflictual conversation. Also, Experiments 1 and 2 showed that relaxation and placidity were lower during the conflictual conversation than the other two conversations. The pleasant conversation generated the highest levels of relaxation, placidity and modesty in Experiment 1. Furthermore, there was an unexpected finding. The data of Experiment 2 showed that provocativeness was greater during the conflictual conversation than the neutral or pleasant conversation. Overall, the current findings suggest that, among the three conversation topics, the pleasant conversation can produce the highest levels of VAS rating of hedonic tone, hedonic tone in conformist state (relaxation and placidity) and transactional gain in autic-mastery (gratitude) and alloic-mastery (modesty) states than the other two conversations. However, the conflictual conversation generates the highest level of provocativeness which is pleasant hedonic tone in a paratelic/negativistic state.

Summary. The findings regarding the impact of the conversation topic on emotions and metamotivational states reflect the importance of the conflictual conversation to bring about the greatest levels of unpleasant emotional outcomes and

the lowest degree of hedonic tone and transactional gain in mother-daughter dyadic interaction. Conversely, the impact of the pleasant conversation on pleasant emotions was not very strong. The data confirms the importance of conflict as the most salient interaction in the parent-adolescent relationship and thus confirms previous finding (Katz et al., 1992; Graber & Brooks-Gunn, 1999; Hall, 1987; Minuchin, 1985; Powers & Welsh, 1999). However, the presence of pleasant emotions during the conflictual conversation and the impact of the neutral conversation on both pleasant and unpleasant emotional outcomes are suggestive of the importance of the operative metamotivational state and motivational styles in generating emotional responses which may not otherwise be explained by situational factors.

High/Low Conflict Group Differences

Experiment 2 compared two groups of low-conflict and high-conflict dyads in terms of the operative metamotivational state, arousal, stress, tension/effort-stress from body and external factors, and pleasant/unpleasant somatic and transactional emotions. The findings of the ANOVAs on ratings of VAS, TESI and TSM were used to compare the two groups in terms of emotions and metamotivational states.

It was hypothesized (2.3) that daughters in the high-conflict group would experience greater levels of unpleasant somatic and transactional emotions than daughters in the low-conflict group. The results from Experiment 2 did not support the prediction. However, Experiment 2 yielded an important finding. For daughters in the high-conflict group, the level of felt arousal was greater for the conflictual conversation than the pleasant conversation whereas this pattern of difference was not observed for daughters in the low-conflict group. This outcome suggests the

greater emotional significance of the conflictual conversation for daughters in the high-conflict group.

It was postulated (2.4) that the high-conflict group would experience greater levels of stress, unpleasant somatic and transactional emotions than the low-conflict dyads. The results of Experiment 2 partially supported the prediction. Although there was no significant difference in VAS rating of stress between the two groups, the data shows that stress for the high-conflict group increased significantly after the conflictual conversation. Also, for the high-conflict group, an increase in stress was evident after the pleasant conversation suggesting that even a pleasant conversation could increase the level of stress for this group. Also, sullenness, shame (only during conflictual conversation), resentment and humiliation were greater for the high-conflict group than the low-conflict group. For the high-conflict group, sullenness was greater after the conflictual conversation than after the pleasant conversation. The group differences regarding unpleasant somatic and transactional emotions indicates lower level of hedonic tone, engagements of the paratelic/negativistic states and higher level of transactional loss for the high-conflict group than the low-conflict group. The findings also revealed the relevance of conflictual conversation in producing transactional loss for the high-conflict group. The findings regarding group differences in stress and unpleasant somatic and transactional emotions lends support to Dix's (1991) findings that negative emotions are discriminators of relationship satisfaction in parent-child dyads.

It was postulated (2.5) that the low-conflict dyads would experience greater levels of pleasant hedonic tone and pleasant somatic and transactional emotions than the high-conflict dyads. The findings of Experiment 2 did not confirm the hypothesis. The findings indicated that the levels of hedonic tone and pleasant

somatic emotions did not significantly differ for the two groups. With respect to the group differences in pleasant transactional emotions, the data revealed that gratitude, pride and virtue were greater for the high-conflict group than the low-conflict group. Given that a similar pattern of differences was found for humiliation, the question arises as to whether or not these group differences in humiliation and pride are interrelated. The possibility that pride was an awareness of one's qualities or a defensive reaction to humiliation remained to be investigated. For virtue, it is likely that at least some participants interpreted this word as meaning a self-righteous attitude more than as representing a transactional gain in an alloic-sympathy state. The data regarding the group differences in hedonic tone, pleasant somatic and transactional emotions shows that transactional gain was greater for the high-conflict group than the low-conflict group. It is also likely that having formal conversation is a rewarding experience for the high-conflict dyads who might normally use alternative types of interaction (e.g., squabbling).

Overall, the high-conflict group are differentiated from the low-conflict group by a greater level of unpleasant somatic and transactional emotions. However, the group differences in hedonic tone, pleasant somatic and transactional emotions do not distinguish the low-conflict group as an achiever of higher levels of pleasant emotions. Rather, the group differences reflect in the significance of the conflictual conversation in producing the unpleasant emotions of sullenness and shame for the high-conflict group. Also, both transactional gain (i.e., pride, virtue and gratitude) and transactional loss (i.e., resentment, shame and humiliation) were greater for the high-conflict group than the low-conflict group. For the high-conflict group, a greater level of transactional gain implies that the low expectation of pleasant interpersonal outcomes by this group may magnify the level of gratitude felt.

Psychophysiological Processes in Mother-Daughter Dyads

Experiments 2 and 3 examined the physiological processes in the low-conflict and high-conflict mother-daughter dyads. Experiment 2 explored individual physiological responding to the audio-tape of the previous conversations while Experiment 3 focused on the physiological linkage between mothers and daughters during the turn-taking conversations.

Individual physiological responding. The results of ANOVAs on the individual physiological responses of mothers and daughters showed that the levels of PWTT, RSA and SCL was greater for daughters than mothers. This outcome could be due to age differences (Stern et al., 1980), or the mother-daughter differences in PWTT and SCL could reflect the higher levels of sympathetic arousal for daughters. The latter explanation is supported by the findings that daughters, while listening to conversations, experienced greater levels of anger and provocativeness than did mothers.

The results of Experiment 2 indicated increases in RESP and FPA and decreases in SCL after listening to conversations. High RESP indicates faster breathing which is caused by high sympathetic arousal. However, increased sympathetic nervous system activity produces decreases in FPA (Brownley et al., 2000) and increases in SCL (Stern et al., 1980). It is possible that FPA was not showing normal direction of changes (e.g., due to very cold hands to start with). However, the finding of Experiment 2 regarding the increases in the levels of arousal, felt arousal and stress lend supports to the assertion that sympathetic arousal increased after listening to the conversations.

The hypothesis (2.6) regarding the comparison of the three conversation topics in terms of physiological arousal was partially supported by the data. Among the physiological measures, RESP and RSA differentiated the three conversation topics. That RESP was faster during the conflictual conversation than the other two conversations is consistent with previous data (DiMascio et. al., 1957; Levenson & Gottman, 1983, 1985; McCarron & Appel, 1971) that sympathetic arousal was greater during the conflictual interaction than the neutral interaction. It was also found that RSA was lower during the conflictual conversation than the pleasant conversation indicating greater parasympathetic withdrawal in response to the conflictual topic (Lane et al., 1992). This finding is consistent with Porges's (1995) assertion that elicitation of negative and positive affects is associated with respective decreases and increases in RSA .

The hypothesis (2.7) that physiological arousal would be greater for the high-conflict group than the low-conflict group was not supported by the data. This outcome is consistent with Levenson and Gottman's (1985) finding. However, the replication of the study using larger samples may yield significant group differences.

It was hypothesized (2.8) that physiological changes would be associated with the felt arousal and hedonic tone. The results of the stepwise multiple regression analyses were used to examine this prediction. Experiment 2 partially confirmed the hypothesis. For each physiological variable, some of the VAS, TSM and TESI ratings emerged as significant predictors. In this respect, both pleasant and unpleasant emotions accounted for the physiological responses during each conversation topic. Also, different emotional predictors of physiological responding emerged for mothers and daughters. There were positive associations between lower VAS rating of hedonic tone and greater HR for mothers, between provocativeness

and shorter PWTT of daughters, and between greater levels of excitement and higher levels of SCL and greater HR of mothers. These data revealed positive association between high-hedonic tone in paratelic state (excitement and provocativeness) and greater sympathetic arousal. However, the association between higher excitement and higher FPA for daughters is not consistent with this interpretation. The above-mentioned issues regarding FPA reliability could be relevant to this outcome. Also, there were associations between higher levels of SCL and lower levels of placidity and relaxation for daughters, between lower level of placidity and greater level of SCL of mothers, between greater anxiety and greater HR and shorter PWTT of mothers. These outcomes show that low hedonic tone in a telic state is related to higher levels of sympathetic arousal. Furthermore, the positive association between greater total telic score and greater SCL for mothers and the inverse association between greater FPA and higher level of seriousness (a subscale of TSM) for mothers provide additional support for the interpretation that low arousal in telic state reduced sympathetic arousal. However, positive associations between greater anxiety and lower RESP of mothers (lower levels of sympathetic tone) and greater RSA of daughters (higher level of parasympathetic tone) are not consistent with this interpretation. The positive association between greater sullenness and longer PWTT indicates that low hedonic tone in paratelic state (felt low arousal) is associated with lower level of sympathetic arousal. However, positive association between greater boredom and lower FPA of mothers indicates the opposite interpretation. Furthermore, Experiment 2 produced contradictory results in that greater stress for external factors was related to lower RESP of daughters and mothers, higher HR of mothers and higher RSA of daughters. However, the positive association between higher body stress and faster RESP of daughters was consistent with relationship

between higher effort-stress for body and lower RSA of daughters because higher RESP decreases RSA.

The exploration of transactional emotions as the predictor variables of physiological responses of mothers and daughters showed associations between humiliation and increased HR of mothers and increased FPA of daughters, between greater virtue and lower FPA of mothers, between greater modesty and greater RESP of daughters, between greater guilt and higher FPA of daughters, and between greater pride and greater HR of daughters. These findings show that higher levels of pleasant and unpleasant transactional emotions are significantly related to either increase or decrease in sympathetic arousal. In this respect, the relationship between the cognitive and emotional factors that mediate between transactional emotions and sympathetic arousal should be a focus of further investigation.

Overall, examination of the predictors of physiological responding shows that low hedonic tone in both telic and paratelic states, high hedonic tone in a paratelic state, and stress for external factors are associated with levels of sympathetic arousal of participants. Higher levels of body stress and effort for body stress are associated with higher levels of sympathetic tone and lower levels of parasympathetic tone respectively. Both transactional loss and gain are related to sympathetic arousal.

Physiological linkage. Experiment 3 examined the physiological linkage between mothers and daughters during the neutral, conflictual and pleasant conversations. It was anticipated (3.1) that the strength of physiological linkage would be associated with the felt arousal. The hypothesis was partially upheld.

The findings of multiple regression analyses concerning the predictors of the strength of different indices of physiological linkage had several implications. The

data showed that each physiological measure could be related to different emotional and metamotivational mechanisms. It was found that stronger physiological linkage for FPA and HR were related to higher and lower levels of preferred arousal of daughters respectively. This outcome may be an artifact of physiological arousal being associated with different directions of response change for HR and FPA, namely, higher physiological arousal is associated with greater HR and lower FPA (Brownley et al., 2000). Also, the findings on HR yielded more significant predictors among somatic and transactional emotions than the data on FPA. It was found that physiological linkage for HR was associated with greater sullenness and virtue of mothers and lower humiliation of daughters. The findings regarding the predictor variables of HR linkage indicates that stronger physiological linkage for HR is associated with lower hedonic one in paratelic state (sullenness) for mothers, lower transactional loss (humiliation) for daughters and greater transactional gain (virtue) for mothers.

The examination of the predictors of different indices of physiological linkage (obtained by averaging data on HR and FPA) yielded important information. There were no significant predictors for the strength of physiological linkage during the neutral conversation. During the pleasant conversation, the total telic state of daughters was the sole significant predictor of weaker physiological linkage. For the conflictual conversation, the positive association between daughters' effort-stress for external factors and shared physiology indicates that the stressful nature of the interaction was associated with increase in the strength of physiological linkage during the dyadic interaction. Also, the predictive value of daughters' gratitude for stronger physiological linkage during the conflictual conversation confirmed that

transactional gain in an autic-sympathy state (gratitude) could strengthen the shared physiology between mothers and daughters during an argumentative interaction.

The analyses on the overall index and mother predict physiological linkage did not yield significant results. For mother lead physiological linkage, there were unexpected outcomes in that lower pride and virtue of daughters were the significant predictors of stronger shared physiology. These findings shows that, when mothers led the conversation, greater transactional gain (pride and virtue) for daughters were associated with lower level of shared physiology. It is likely that each transactional emotion triggers specific cognitive and behavioural factors which impact on the strength of physiological linkage during dyadic interaction.

The data also revealed that placidity of daughters emerged as the substantial predictor of weaker daughter predict physiological linkage. This finding implies that, for daughters, higher level of hedonic tone in telic/negativistic state (placidity) was associated with weaker daughter predict physiological linkage. Also, when daughters led the conversation, greater level of felt arousal and higher level of hedonic tone in a paratelic/negativistic state (provocativeness) were associated with stronger physiological linkage between mothers and daughters. The findings that daughters' ratings of emotions and metamotivational states were more related to the strength of physiological linkage than those of mothers could indicate that daughters were the affective controllers of the interactions. The findings regarding the predictors of shared physiology shows that high hedonic tone in telic/conformist state (placidity) and high hedonic tone in paratelic/negativistic state (provocativeness) of daughters, low hedonic tone in paratelic/negativistic state (sullenness) for mothers, transactional gain (gratitude and virtue) for mothers and transactional loss (humiliation) and

transactional gain (pride and pride) of daughters were related to the strength of shared physiology.

Overall the results of multiple regression analyses regarding the predictors of individual physiological responding and the physiological linkage between mothers and daughters confirmed the validity of the reversal theory emotions in accounting for the physiological processes in dyadic interaction. The data revealed the impact of different transactional and somatic pairs of states on the strength of shared physiology. However, an investigation of various cognitive and behavioural correlates of metamotivational states could elucidate the nature of the contradictory results regarding the relationship between transactional loss/gain and shared physiology.

It was hypothesized (3.2) that the physiology of the listener would follow the story teller. This hypothesis was only confirmed by the ANOVA on the strength of physiological linkage for HR. The ANOVA on the strength of physiological linkage for FPA did not yield any significant outcome. This outcome for HR linkage was consistent with O'Mara's (2001) data on married couples which showed that the physiology of the listener followed the response pattern of the story teller. Also, it was found that HR of daughters predicted the response pattern of mothers significantly better than vice versa. This finding was in line with the results of Wagner and Calam's (1988) study on parent-child dyads which revealed that the parents' HR followed the response pattern of their child.

It was anticipated (3.3) that the physiological linkage would occur and increase from the neutral to pleasant and be highest for the conflictual conversation. The ANOVAs on HR and FPA did not confirm the hypothesis. However, the lack of significant differences in physiological linkage across the three conversations is

consistent with previous data on married couples and parent-child dyads (Levenson & Gottman, 1983; O'Mara, 2001; Wagner & Calam, 1988). However, it is suggested that more intense interactional contexts could better differentiate the levels of shared physiology than the interactions used in this study. For instance, an argument regarding an intense private issue (e.g., drug problem or the risky sexual behaviour) could lead to higher level of physiological linkage during mother-daughter interactions than a discussion of a minor conflict regarding what the teenager eats.

It was postulated (3.4) that the physiological linkage would be greater for the high-conflict group than the low-conflict group. The ANOVAs on HR and FPA did not yield any main effect for conflict. However, for the high-conflict group, the strength of physiological linkage for FPA was greater during the conflictual conversation than the pleasant conversation. The data reflects the significance of the conflictual conversation in generating the highest level of the physiological linkage in the high-conflict group. The outcome also supports the Levenson and Gottman's (1983) finding that physiological linkage during a conflictual segment was predictive of 59% of marital satisfaction for distressed couples.

Implicit in the data regarding the group differences in shared physiology is that the members of the high-conflict dyads are more accustomed to be physiologically connected during arguments than the happy contexts. The data complements the previous data regarding the physiological linkage as an index of marital dissatisfaction (Levenson & Gottman, 1983) and empathy (Levenson & Ruef, 1992; O'Mara; 2001) by proposing that, in line with Hoffman's (1990) contention, learnt experiences and conditioning determines the contextual features and emotional experience which connect the physiology of two persons during a dyadic interaction. In other words, the client-therapist dyads and distressed married couples have gained

prior experiences in being exposed to and having to respond to the physiological responses of each other during an empathic therapeutic interaction and conflictual conversation respectively.

Overall, the findings on physiological linkage during the mother-daughter dyadic interaction yielded more significant predictor variables for the strength of physiological linkage for HR than those of FPA. Also, the reversal theory measures of emotions and metamotivational states have significantly predicted the strength of different indices of physiological linkage, and have provided plausible interpretations for the data on each segment and extended the previous knowledge on shared physiology. The data demonstrates the important predictive values of daughters' emotions on the strength of shared physiology. The data showed the impact of the listening on the direction of physiological linkage between mothers and daughters, and distinguished the high-conflict group from the low-conflict group by the importance of the conflictual conversation in increasing the level of physiological linkage for the high-conflict group.

Methodological Limitations

In spite of the many meaningful implications of the current findings for the emotional and psychophysiological processes in mother-daughter dyads, generalizing the data to other populations should be undertaken with caution. There are some methodological limitation which should be noted.

1. Given the relatively small and homogenous nature of the sample, there is a need to replicate the experiment on larger and heterogenous samples, including other parent-child dyads to demonstrate the reliability of the present findings and to extend the external validity to general family interactions. Also, the small numbers in each

group reduces the power of statistical comparisons and increases the possibility of Type 2 errors, that is, the increase in the probability of rejecting real differences as being non-significant. Furthermore, different socioeconomic and cultural factors may also influence and change the results.

2. The study was exploratory and used a large number of variables which were not previously used in these kinds of situations. Because of the exploratory nature of the study, it was decided to keep α level at .05 even though the number of multiple comparisons could adversely affect the Type 1 error rate.

3. Another limitation concerns the experimental setting which might cause the participants to behave in a socially desirable manner or to choose issues for discussions which are more comfortable topics to discuss under observation and in a place other than home. This could affect the ecological validity of the findings. Future studies should consider research settings which better fill the gap between home and physiological laboratory.

Theoretical Implications

The current findings confirmed the significant applicability of reversal theory, as a phenomenological structural approach, in exploring the emotional processes in mother-daughter dyads. The phenomenological aspect of the theory, by focusing on the subjective experience and using the individual's appraisal of emotions as the frame of reference, explored areas which had not been investigated by observational studies of emotional expression. The structural feature of the theory demonstrated that the application of metamotivational state(s) and dominance can increase the depth and scope of information regarding the emotional and physiological processes in mother-adolescent daughter dyads. The results of the three experiments

demonstrate the capacity of reversal theory to accommodate the empirical data on parent-adolescent conflict in terms of negativity in adolescents and in parents' desire for control. Reversal theory measures of emotions and dominance extended the previous research knowledge by indicating that the motivational styles and reversal processes can jointly account for the certain patterns of and lability of emotional experience during parent-child dyadic interaction.

The findings from the current experiments depicted mother/daughter and group differences in operative metamotivational states and motivational styles and the interplay between these factors and contextual contingencies. The data also indicates that the adolescent's desire for high arousal and negativity and the parent's preference for the auitc-mastery state might generate emotional experiences which may not otherwise be explained by the situational factors. The reversal theory account of emotions was able to add new information to the previous research by suggesting that, on the basis of particular metamotivational state, it is possible to experience high hedonic tone and transactional gain in a conflictual context; or the pleasant and neutral interactions can set the stage for unpleasant emotions.

The examination of psychophysiological process in mother daughter dyads revealed that the physiological data can not be understood without reference to the operative metamotivational state of the individual. In this respect, the reversal theory account of emotions were effective in providing explanations of the physiological concomitants of emotional experience and physiological linkage between mothers and daughters. The results threw further light onto the nature of shared physiology by suggesting that the history of the relationship may determine the context within which the physiological linkage is more likely to occur.

Despite the implications of data, the current studies can not claim to elucidate all the complexity in emotional processes in mother-daughter dyads. The above-mentioned methodological limitations warrant the replication of data on larger samples with different compositions. Furthermore, with reference to subjective experience, the examination of verbal and non-verbal features of the relationship that trigger reversal to particular metamotivational state could be useful and important. Such investigation could cast light into the sequences that represent the mothers' and daughters' contribution to, and share of, emotional and physiological outcomes in mother-daughter dyadic interaction. The findings of the three experiments confirmed the previous data regarding the prominence of conflict in parent-adolescent relationship. Given the presence of negative emotions during neutral and pleasant conversations, further exploration of the frequency and quality of such interactions within the parent-adolescent relationship and the pertinent emotional and physiological outcomes are promising areas for investigation.

Overall, the findings have important implications for the parent-child conflict. The data reflects various determinants of perceived conflict between parent and adolescent child including parent's characteristics (e.g., parenting skill, parent's stress,), anger intensity, the dynamics in family environment and psychopathology. Also, the differences in metamotivational dominance between parent (e.g., arousal-avoiding) and adolescent (e.g., arousal-seeking) can increase the level of perceived conflict and unpleasant emotions during parent-child dyadic interaction. In this respect, the operative metamotivational states of parent and adolescent could add further complexity to the emotional outcomes: a particular interactional context can trigger reversals to different metamotivational state(s) for each party and provide

various and different levels of hedonic tone and transactional gain for the parent and the adolescent.

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Appendix A

Consent Forms, Questionnaires and Tests

Appendix A1: Consent Forms

Appendix A2: Demographic Information Sheets

Appendix A3: The Family Environment Scale (Moos & Moos, 1994)

Appendix A4: The Parenting Stress Index (Abidin,1986)

Appendix A5: The Parent Child Response Sheet (Wood & Davidson, 1987)

Appendix A6: The Visual Analogue Scales (McCormack, Horne & Sheater, 1988)

Appendix A7: The Issues Checklist (Robin & Foster, 1989)

Appendix A8: The Telic State Measure (Svebak & Murgatoryd, 1985)

Appendix A9: The Tension and Effort Stress Inventory (Svebak, 1987)

Appendix A10: The Brief Symptoms Inventory (Derogatis & Melisaratos, 1983)

Appendix A11: The Metamotivational Styles Profile (Apter, Mallos & Williams,1982)

Appendix A1

Consent Forms

Experiment 1 :

University of Tasmania

Department of Psychology

Consent Form

The study being conducted by Ms. Robabeh Ghafar- Tabrizi PhD., University of Tasmania, under the supervision of Dr. Iain Montgomery and Dr. George Wilson is an attempt to understand the aspects of mother-daughter dyadic interaction.

Participants in this study will be asked to answer brief questionnaires about themselves. This will include such things as health, family environment, parenting stress, motivational characteristics, and conflict resolution skills. They will participate in three five-minute pleasant, neutral and conflictual conversation tasks.

Participation in this study is voluntary and you may withdraw without prejudice from the study at any time by stating a wish to do so. If there are any questions or concerns about the study you may discuss them with Ms. Ghafar-Tabrizi on 202246, or Dr. Iain Montgomery on 202386.

We have read the information about the study and any questions we have asked have been answered to my satisfaction. We agree to participate in this investigation and understand that we may withdraw at any time without prejudice. We agree that research data gathered for the study may be published provided that I can not be identified as a subject.

Signature of mother..... Date.....
Signature of daughter..... Date.....

I have explained this project and the implications of participation in it to these volunteers and I believe that the consent is informed and that they understand the implications of participation.

Signature of investigator..... Date.....

Experiment 2

University of Tasmania

Department of Psychology

Consent Form

The study being conducted by Ms. Robabeh Ghafar- Tabrizi Ph D., University of Tasmania, under the supervision of Dr. Iain Montgomery and Dr. George Wilson is an attempt to understand the aspects of mother-daughter dyadic interaction.

In the second Experiment of this study, participants will be asked to answer brief questionnaires about themselves. They will also listen to the their previous neutral conflictual and pleasant conversations while their heart rate, pulse change, respiration, and skin conductance level will be measured. In order to do these measurement, a number of electrodes will be attached to their non-dominant hand and chest. Placement of these electrodes will produce minimal, if any, discomfort.

Participation in this study is voluntary and you may withdraw without prejudice from the study at any time by stating a wish to do so. If there are any questions or concerns about the study you may discuss them with Ms. Ghafar-Tabrizi on 202246, or Dr. Iain Montgomery on 202386.

We have read the information about the study and any questions we have asked have been answered to my satisfaction. We agree to participate in this investigation and understand that we may withdraw at any time without prejudice. We agree that research data gathered for the study may be published provided that I can not be identified as a subject.

Signature of mother..... Date.....
Signature of daughter..... Date.....

I have explained this project and the implications of participation in it to these volunteers and I believe that the consent is informed and that they understand the implications of participation.

Signature of investigator..... Date.....

Experiment 3 :

University of Tasmania

Department of Psychology

Consent Form

The study being conducted by Ms. Robabeh Ghafar- Tabrizi PhD., University of Tasmania, under the supervision of Dr. Iain Montgomery and Dr. George Wilson is an attempt to understand the aspects of mother-daughter dyadic interaction.

In the third experiment of this study each member of mother-daughter pair will, in turn, talk about a neutral, positive and conflictual issue while the other member is listening without any interruption. During these alternate conversations, their heart rate, pulse change and skin conductance level will be measured. In order to do these measurement, a number of electrodes will be attached to their non-dominant hand and chest. Placement of these electrodes will produce minimal, if any, discomfort. The participants will be asked to rate their moods and emotions on brief scales and after each talk.

Participation in this study is voluntary and you may withdraw without prejudice from the study at any time by stating a wish to do so. If there are any questions or concerns about the study you may discuss them with Ms. Ghafar-Tabrizi, or Dr. Iain Montgomery.

We have read the information about the study and any questions we have asked have been answered to my satisfaction. We agree to participate in this investigation and understand that we may withdraw at any time without prejudice. We agree that research data gathered for the study may be published provided that I can not be identified as a subject.

Signature of mother..... Date.....
Signature of daughter..... Date.....

I have explained this project and the implications of participation in it to these volunteers and I believe that the consent is informed and that they understand the implications of participation.

Signature of investigator..... Date.....

Appendix A2

Demographic Information Sheets

1) Mothers' Form

Dear Participant

This questionnaire asks about you and your family. Please answer these questions as well as you can. You can ask the researcher to explain any part of the questionnaire that you do not quite understand. The information obtained by this questionnaire will remain confidential. Your cooperation is much appreciated.

Name..... Date of Birth .....
Occupation ..... Education.....

Marital status: ☐Married ☐Divorced ☐Single

☐Separated but not divorced ☐Widowed

.

How many children do you have?.....

Please mention their name, age, occupation and education.
(1)
(2)
(3)
(4)
(5)

Have you and/or your children ever participated in Parenting Effectiveness Training (PET) course? Yes ☐ No☐

Please write any other information that you want to add to this questionnaire.

If you are available during day please write your phone number.

2) Daughters' Form

Dear Participant

This questionnaire inquires information about you and your family. Please answer these questions as correctly as you can. You can ask the researcher to explain any part of the questionnaire that you do not quite understand. We assure you that the information obtained by this questionnaire will remain confidential. Your cooperation is highly appreciated.

Name..... Date of Birth .....
Occupation .....

Grade (year):..... High school..... College.....
University.....

Whom do you live with?.....
The name of your mother..... age..... Occupation.....
Education.....
The name of your father..... age..... occupation.....
Education.....

How many siblings do you have?.....

If any, Please mention their name age and occupation.
(1)
(2)
(3)
(4)
(5)

Have you and/or your parents ever participated in Parenting Effectiveness Training (PET) course? ☐Yes ☐No

Please write any other information that you want to add to this questionnaire.

Home address:

Phone number :
Home:
Work:

Appendix A3

The Family Environment Scale (Moos & Moos, 1994)

Your Name_____
Age_____

Dear participant:
There are 90 statements in this questionnaire. Please read each statement. If you think the statement is True or mostly True of your family, make an X in the box labelled T (true). If you think the statement is False or mostly False of your family, make an X in the box labelled F (False).

---

1. Family members really help and support one another.
T☐ F☐
2. Family members often keep their feelings to themselves.
T☐ F☐
3. We fight a lot in our family.
T☐ F☐
4. We don't do things on our own very often in our family.
T☐ F☐
5. We feel it is important to be the best at whatever you do.
T☐ F☐
6. We often talk about political and social problems.
T☐ F☐
7. We spent most weekends and evenings at home.
T☐ F☐
8. Family members attend church. Synagogue, or Sunday School fairly often.
T☐ F☐
9. Activities in our family are pretty carefully planned.
T☐ F☐
10. Family members are rarely ordered around .
T☐ F☐
11. We often seem to be killing time at home.
T☐ F☐
12. We say anything we want to around home.
T☐ F☐
13. Family members rarely become openly angry.
T☐ F☐
14. In our family, we are strongly encouraged to be independent.
T☐ F☐
15. Getting ahead in life is very important in our family.
T☐ F☐
16. We rarely go to lectures, plays or concerts.
T☐ F☐
17. Friends often come over for dinner or to visit.
T☐ F☐

18. We don't say prayers in our family.
T☐ F☐
19. We are generally very neat and orderly.
T☐ F☐
20. There are very few rules to follow in our family.
T☐ F☐
21. We put a lot of energy into what we do at home.
T☐ F☐
22. It's hard " to blow off steam" at home without upsetting somebody.
T☐ F☐
23. Family members sometimes get so angry they throw things.
T☐ F☐
24. We think things out for ourselves in our family.
T☐ F☐
25. How much money a person makes is not very important to us.
T☐ F☐
26. Learning about new and different things is very important in our family.
T☐ F☐
27. Nobody in our family is active in sports, Little League, bowling, etc.
T☐ F☐
28. We often think about the religious meaning of Christmas, Passover, or other holidays.
T☐ F☐
29. It's often hard to find things when you need them in our household.
T☐ F☐
30. There is one family member who makes most of the decisions.
T☐ F☐
31. There is a feeling of togetherness in our family.
T☐ F☐
32. We tell each other about our personal problems.
T☐ F☐
33. Family members hardly ever lose their tempers.
T☐ F☐
34. We come and go as we want to in our family.
T☐ F☐
35. We believe in competition and "may the best man win".
T☐ F☐
36. We are not that interested in cultural activities.
T☐ F☐
37. We often go to movies, sports events, camping, etc.
T☐ F☐
38. We don't believe in heaven or hell.
T☐ F☐
39. Being on time is very important in our family.
T☐ F☐
40. There are set ways of doing things at home.
T☐ F☐
41. We rarely volunteer when something has to be done at home.
T☐ F☐

42. If we feel like doing something on the spur of the moment we often just pick up and go.
T☐ F☐
43. Family members often criticize each other.
T☐ F☐
44. There is very little privacy in our family.
T☐ F☐
45. We always strive to do things just a little better the next time.
T☐ F☐
46. We rarely have intellectual discussions.
T☐ F☐
47. Everyone in our family has a hobby or two.
T☐ F☐
48. Family members have strict ideas about what is right and wrong.
T☐ F☐
49. People change their minds often in our family.
T☐ F☐
50. There is strong emphasis on following rules in our family.
T☐ F☐
51. Family members really back each other up.
T☐ F☐
52. Someone usually gets upset if you complain in our family.
T☐ F☐
53. Family members sometimes hit each other.
T☐ F☐
54. Family members almost always rely on themselves when a problem comes up.
T☐ F☐
55. Family members rarely worry about job promotions, school grades, etc.
T☐ F☐
56. Someone in our family plays a musical instrument.
T☐ F☐
57. Family members are not very involved in recreational activities outside work or school.
T☐ F☐
58. We believe there are some things you just have to take on faith.
T☐ F☐
59. Family members make sure their room are neat.
T☐ F☐
60. Every one has an equal say in family decisions.
T☐ F☐
61. There is very little group spirit in our family.
T☐ F☐
62. Money and paying bills is openly talked about in our family.
T☐ F☐
63. If there's a disagreement in our family, we try hard to smooth things over and keep the peace.
T☐ F☐
64. Family members strongly encourage each other to stand up for their rights.
T☐ F☐

65. In our family, we don't try that hard to succeed.
T☐ F☐
66. Family members often go to the library.
T☐ F☐
67. Family members sometimes attend courses or take lessons for some hobby or interest (outside of school).
T☐ F☐
68. In our family each person has different ideas about what is right and wrong.
T☐ F☐
69. Each person's duties are clearly defined in our family.
T☐ F☐
70. We can do whatever we want in our family.
T☐ F☐
71. We really get along well with each other.
T☐ F☐
72. We are usually careful about what we say to each other.
T☐ F☐
73. Family members often try to open-up or out-do each other.
T☐ F☐
74. It's hard to be by yourself without hurting someone's feelings in our household.
T☐ F☐
75. "Work before play" is the rule in our family.
T☐ F☐
76. Watching T.V. is more important than reading in our family.
T☐ F☐
77. Family members go out a lot.
T☐ F☐
78. The bible is a very important book in our home.
T☐ F☐
79. Money is not handled very carefully in our family.
T☐ F☐
80. Rules are pretty inflexible in our household.
T☐ F☐
81. There is plenty of time and attention for everyone in our family.
T☐ F☐
82. There are a lot of spontaneous discussions in our family.
T☐ F☐
83. In our family, we believe you don't ever get anywhere by raising your voice.
T☐ F☐
84. We are not really encouraged to speak up for ourselves in our family.
T☐ F☐
85. Family members are often compared with others as to how well they are doing at work or school.
T☐ F☐
86. Family members really like music, art and literature.
T☐ F☐
87. Our main form of entertainment is watching T.V. or listening to the radio.
T☐ F☐

88. Family members believe that if you sin you will be punished.
T☐ F☐
89. Dishes are usually done immediately after eating.
T☐ F☐
90. You can't get away with much in our family.
T☐ F☐

Appendix A4
The Parenting Stress Index

Selected items form the Child Domain and all items from the Parent Domain of The Parenting Stress Index (Abidin, 1986)

Direction:

In answering the following questions, please think about your daughter who is participating in this study. The questions on the following pages ask you to mark an answer which best describes your feelings. While you may not find an answer which exactly states your feelings, please mark the answer which comes closest to describing how you feel. **YOUR FIRST REACTION TO EACH QUESTION SHOULD BE YOUR ANSWER.**

Please mark the degree to which you agree or disagree with the following statements by filling in the number which best matches how you feel. If you are not sure, please fill in #3.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

Example: 1 | (2) 3 4 5 I enjoy going to the movies. (If you sometimes enjoy going to the movies , you would fill in #2).

1-When my daughter wants something, she usually keeps trying to get it.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

10- My daughter rarely does things that make me feel good.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

11- Most times I feel that my daughter likes me and wants to be close to me.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

12- Most times I feel that my daughter doesn't like me and doesn't want to be close to me.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

14- When I do things for my daughter I get the feelings that my efforts are not appreciated very much.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

17- My daughter seems to cry or fuss more often than most adolescents.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

19- My daughter generally wakes up in bad mood.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

20- I feel that my daughter is very moody and easily upset.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

21- My daughter looks a little different than I expected and it bothers me at times.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

25- My daughter does a few things which bother me a great deal.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

27- My daughter doesn't like to be hugged or touched very much.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

28- When my daughter came home from hospital (after birth), I had doubtful feelings about my ability to handle being a parent.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

29- Being a parent is harder than I thought it would be.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

30- I feel capable and on top of things when I am caring for my daughter.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

32- -My daughter reacts very strongly when something happens that she doesn't like.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

34- My daughter gets upset easily over the smallest thing.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

40- When upset, my daughter is:

1. easy to calm down,
2. harder to calm down than I expected,
3. very difficult to calm down,
5. nothing I do helps to calm her.

41- I have found that getting my daughter to do something or stop doing something is:

1. much harder than I expected,
2. somewhat harder than I expected,
3. about as harder than I expected,
4. somewhat easier than I expected,
5. much easier than I expected.

43- When my daughter cries it usually lasts:

1. less than 2 minutes,
2. 22-5 minutes,
3. 5-10 minutes,
4. 10-15 minutes,
5. more than 15 minutes.

44- There are some things my daughter does that really bother me a lot.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

45-My daughter has more health problem than I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

46- As my daughter has grown older and become more independent , I find myself more worried that she get hurt or into trouble.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

47- My daughter turned out to be more of a problem than I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

48- My daughter seems to be much harder to care for than most.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

50- My daughter makes more demands on me than most adolescents.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

51- I can not make decisions without help.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

52- I have had many more problems raising children than I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

53- I enjoy being a parent.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

54- I feel that I am successful most of the times when I try to get my daughter to do or not do something.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

55- Since I brought my daughter from hospital (after birth), I found that I was unable to take care of her as well as I thought I could, I needed help.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

56- I often have the feeling that I can not handle things very well.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

57- When I think myself as a parent I believe:

1. I can handle anything that happens,
2. I can handle most things pretty well,
3. sometimes I have doubts, but find that I handle most things without any problems,
4. I have some doubts about being able to handle things,
5. I don't think I handle things very well at all

58- I feel that I am:

1. a very good parent,
2. a better than average parent,
3. an average parent,
4. a person who has some trouble being a parent,
5. not very good at being a parent.

59- What where the highest levels in school or college you and your daughter's father have completed?

Mother:

1. 1-8th grade
2. 9-12th grade
3. Vocational or some college
4. College graduate
5. Graduate or professional school

60- Father:

1. 1-8th grade
2. 9-12th grade
3. Vocational or some college
4. College graduate
5. Graduate or professional school

61- How easy is for you to understand what your daughter wants or needs?

1. very easy,
2. easy,
3. somewhat difficult,
4. it is very hard,
5. I usually can't figure out what the problem is.

62- It takes a long time for parents to develop close, warm feelings for their children.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

63- I expected to have closer and warmer feeling for my daughter than I do and this bothers me.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

64- Sometimes my daughter does things that bother just to be mean.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

65- When I was young, I never felt comfortable holding or taking care of children.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

66- My daughter knows I am her parent and wants me more than other people.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

67- The number of children that I have now is too many.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

68- Most of my life is spent doing things for my daughter.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

69- I find myself giving up more of my life to meet my children needs than I ever expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

70- I feel trapped by my responsibilities as a parent.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

71- I often feel that my daughter's needs control my life.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

72- Since having my daughter I have been unable to do new and different things.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

73- Since having a child I feel that I am almost never able to do things that I like to do.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

74- It is hard to find a place in our home where I can go to be by myself.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

75- When I think about the kind of parent I am, I often feel guilty or bad about myself.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

76- I am unhappy with the last purchase of clothing that I made for myself.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

77- when my daughter misbehaves or fusses too much I feel responsible , as if I didn't do something right.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

78- I feel everytime my daughter does something wrong it is really my fault.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

79. I often feel guilty about the way I feel towards my daughter.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

80- There are quite a few things that bother me about my life.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

81- I felt sadder and more depressed than I expected after leaving the hospital with my daughter (after birth).

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

82- I wind up feeling guilty when I get angry at my daughter and this bothers me.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

83- After my daughter had been home from hospital for about a month (after birth), I noticed that I was feeling more sad and depressed than I had expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

84- Since having my daughter, my spouse (or male friend) has not given me as much help and support as I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

85- Having my daughter has caused more problems than I expected in my relationship with my spouse (or male friend).

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

86- Since having my daughter, my spouse (or male friend) and I don't do as many things together.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

87- Since having my daughter my spouse (or male friend) and I don't spend as much time together as a family as I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

88- Since having my last child, I have had less interest in sex.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

89- Having my daughter seems to have increased the number of problems we have with in-laws and relatives.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

90- Having children has been much more expensive than I expected.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

91- I feel alone and without friends.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

92- When I go to a party I usually expect not to enjoy myself.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

93- I am not as interested in people as I used to be.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

94- I often have the feeling that other people my own age don't particularly like my company.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

95- When I run into a problem taking care of my children I have a lot of people to whom I can talk to get help or advice.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

96- Since having children I have a lot fewer chances to see my friends and to make new friends.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

97- During the past six months I have been sicker than usual or have had more aches and pains than I normally do.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

98- Physically, I feel good most of the time.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

99- Having my daughter has caused changes in the way I sleep.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

100- I don't enjoy things as I used to.

1	2	3	4	5
Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

101- Since I've had my daughter:

1. I have been sick a great deal,
2. I haven't felt as good,
3. I haven't noticed any change in my health,
4. I have been healthier.

During the last 12 months, have any of the following events occurred in your immediate family? Please tick here any that have happened

102. Divorce
103. Marital reconciliation
104. Marriage
105. Separation
106. Pregnancy
107. Other relative moved into household
108. Income increased substantially (20% or more)
109. Went deeply into debt
110. Moved to new location
111. Promotion at work
112. Income decreased substantially
113. Alcohol or drug problem
114. Death of close family friend
115. Began new job
116. Entered new school
117. Trouble with supervisors at work
118. Trouble with teachers at school
119. Legal problems
120. Death of immediate family member

Appendix A5

The Parent-Child Response Sheet (Wood & Davidson, 1987)

As each statement or situation is read out, write down your response as it would be today, in one or two sentences. Please write down your response below each statement or situation

1. (a) 10 year old girl, bright, attractive:

"I don't know why the kids at school don't like me. I try ever so hard to make friends, but they all tease me and make fun of me. I suppose it's because I'm not pretty. I'm so unhappy. I wish I wasn't me".

(b) 7-year old girl always hitting and starting fights with her brother or a friend:

" I never pick fights. You always blame me. How come you yell at me and you never say anything to him? You like him better than me and you always have. I hate him and I hate you!

2. (a) What would you say if you were the parent in this situation?

You are backing the car out and you nearly hit your 12-year old daughter's bike, which is left on its side right in the way.

(b) Your 8-year old daughter has promised to tidy her clothes after school. You go in to see if she has, and you find everything strewn over the bed and the floor.

3. (a) Your 14-year old daughter has promised to help you with chores on Saturday afternoon, but in the afternoon she comes to you and says she has been asked to go with her friends to a film she really wants to see.

(b) 6-year old girl, upset:

"It's not fair. Peter always wants to change the channel when I'm watching TV, and he won't ever change it for me when he's watching, and now Dad says he wants his program on, and I can't watch at all".

Appendix A6

The Visual Analogue Scales (McCormack, Horne & Sheater, 1988)

Date..... **Time**.....

Name.....

Use these scales to indicate how you feel right now. Please complete these scales on your own without discussing with anyone else. Mark each line at the point which best describes how you feel. A mark near the middle means no particular feelings one way or another about the situation in question.

1. I feel the conversation between my mother and I was:

unreal |——————————————————————| real

1. I feel that my mother's behaviour was:

unnatural |——————————————————————| natural

1. I feel that my behaviour was:

unnatural |——————————————————————| natural

1. At this stage of experiment I feel:

comfortable or calm |——————————————————————| worried

sleepy |——————————————————————| active

unpleasant |——————————————————————| pleasant

Appendix A7: Issues Checklist (Robin & Foster, 1989)

Below is a list of things that sometimes get talked about at home. Circle YES for the topics that you and your daughter have talked about at all during the last 4 weeks. Circle No for those that have not come up.

Go down this column for all 3 pages. Then come back to this page and answer the questions on the right.

How many times during the last 4 weeks has it come up?

(Give a number)

Name: **Date:**

How hot are the discussions for each topic?

Topic			How many times	Calm			A little angry	Angry
1. Telephone calls	yes	no		1	2	3	4	5
2. Time for going to bed	yes	no		1	2	3	4	5
3. Cleaning up bedroom	yes	no		1	2	3	4	5
4. Doing homework	yes	no		1	2	3	4	5
5. Putting away clothes	yes	no		1	2	3	4	5
6. Using the television	yes	no		1	2	3	4	5
7. Cleanliness (washing, showers, brushing teeth)	yes	no		1	2	3	4	5
8. Which clothes to wear	yes	no		1	2	3	4	5
9. How neat clothing looks	yes	no		1	2	3	4	5
10. Making too much noise at home	yes	no		1	2	3	4	5
11. Table manners	yes	no		1	2	3	4	5
12. Fighting with brothers and sisters	yes	no		1	2	3	4	5
13. Cursing	yes	no		1	2	3	4	5
14. How money is spent	yes	no		1	2	3	4	5

Topic			How many times	Calm		A little angry		Angry
15. Picking books or movies	yes	no		1	2	3	4	5
16. Allowance	yes	no		1	2	3	4	5
17. Going places without parents (shopping, movies, etc.)	yes	no		1	2	3	4	5
18. Playing stereo or radio too loudly	yes	no		1	2	3	4	5
19. Turning off lights in house	yes	no		1	2	3	4	5
20. Drugs	yes	no		1	2	3	4	5
21. Taking care of records, games, pets, and other things	yes	no		1	2	3	4	5
22. Drinking beer or other liquor	yes	no		1	2	3	4	5
23. Buying records, games, toys, and things	yes	no		1	2	3	4	5
24. Going on dates	yes	no		1	2	3	4	5
25. Who should be friends	yes	no		1	2	3	4	5
26. Selecting new clothes	yes	no		1	2	3	4	5
27. Sex	yes	no		1	2	3	4	5
28. Coming home on time	yes	no		1	2	3	4	5
29. Getting to school on time	yes	no		1	2	3	4	5
30. Getting low grades in school	yes	no		1	2	3	4	5

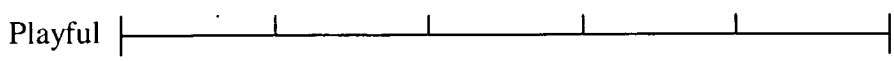
Topic			How many times	Calm		A little angry		Angry
31. Getting in trouble at school	yes	no		1	2	3	4	5
32. Lying	yes	no		1	2	3	4	5
33. Helping out around the house	yes	no		1	2	3	4	5
34. Talking back to parents	yes	no		1	2	3	4	5
35. Getting up in the morning	yes	no		1	2	3	4	5
36. Bothering parents when they want to be left alone	yes	no		1	2	3	4	5
37. Bothering teenager when he/she wants to be left alone	yes	no		1	2	3	4	5
38. Putting feet on furniture	yes	no		1	2	3	4	5
39. Messing up the house	yes	no		1	2	3	4	5
40. What time to have meals	yes	no		1	2	3	4	5
41. How to spend free time	yes	no		1	2	3	4	5
42. Smoking	yes	no		1	2	3	4	5
43. Earning money away from the house	yes	no		1	2	3	4	5
44. What teenager eats	yes	no		1	2	3	4	5
Now go back to the first page and follow the directions on the right hand side of the pages.								

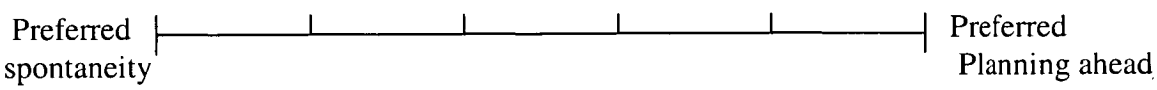
Appendix A8

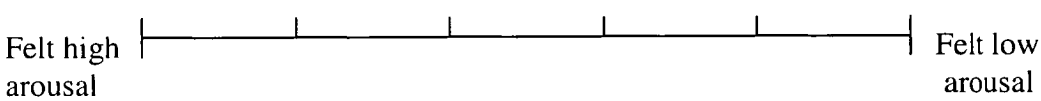
The Telic State Measure (Svebak & Murgatroyd, 1985)

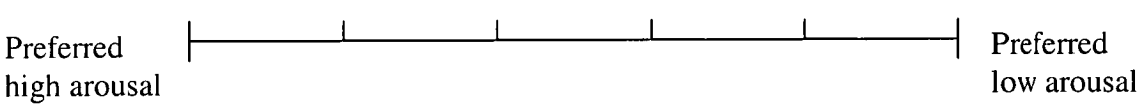
Dear Participant:

Please place a cross (x) to indicate your position along all lines. Respond to how you feel right now.









Additional instructions for the TSM:

Please read the description for each item.

1. By **"serious"** here is meant the feelings that you are pursuing (or at least thinking about) some essential goal. For example the goal may be to achieve something in the future which you believe to be important , or it may be to overcome some real danger or threat in the present.

   By **"playful"** is meant the feeling that you are doing what you are doing for its own sake. In this case your activity is felt to be enjoyable in itself and not require any further justification. Any goal which there might be is really an excuse for the behaviour.

2. By **"planning ahead"** is meant trying to organzine your behaviour in such a way that leads effectively to some goal in the (perhaps distant) future, and being aware of the future consequences of your present actions.

   By **"spontaneous"** is meant that your actions are undertaken on impulse with little regard for future consequences. Note that this scale asks for your preference at time in question, rather than your ability to plan or be spontaneous.

3. By **"arousal"** is meant how "worked up' you feel. You might experience **high arousal** in one of a variety of ways, for example, as excitement or anxiety or anger. **Low arousal** might also be experienced by you in a number of different ways, for example as relaxation or boredom or calmness.

4. **"Arousal"** has the same meaning for the final scale as for the previous one. But now the emphasis is on the level of arousal you want rather than the level of arousal which you are actually experiencing.

Appendix 9 : The Tension and Effort Stress Inventory (Svebak, 1987)

Subject code:	Sex	Age

Please give your answers by *circling* the appropriate figures.

A. Estimate the degree of ***pressure***, stress, challenge, or demand that you are exposed to in the *current situation* as due to:

	No pressure						Very much
External factors:	1	2	3	4	5	6	7
Your own body:	1	2	3	4	5	6	7

B. Estimate the degree of ***effort*** that you put up in the *current situation* to cope with pressure etc. from:

	No effort						Very much
External factors:	1	2	3	4	5	6	7
Your own body:	1	2	3	4	5	6	7

C. Estimate here the degree to which you experience the following ***moods or emotions*** in the *current situation:*

	Not at all						Very much
Relaxation:	1	2	3	4	5	6	7
Anxiety:	1	2	3	4	5	6	7
Excitement:	1	2	3	4	5	6	7
Boredom:	1	2	3	4	5	6	7
Placidity:	1	2	3	4	5	6	7
Anger:	1	2	3	4	5	6	7
Provocativeness:	1	2	3	4	5	6	7
Sullenness:	1	2	3	4	5	6	7
Pride:	1	2	3	4	5	6	7
Humiliation:	1	2	3	4	5	6	7
Modesty:	1	2	3	4	5	6	7
Shame:	1	2	3	4	5	6	7
Gratitude:	1	2	3	4	5	6	7
Resentment:	1	2	3	4	5	6	7
Virtue:	1	2	3	4	5	6	7
Guilt:	1	2	3	4	5	6	7

Thank you!

Designed 1987 by Sven Svebak, Department of Somatic Psychology, Arstadveien 21, N-5009 Bergen, Norway.

Additional Instructions for the TESI:

Stress: Pressure or worry resulting from mental physical distress, difficult circumstances, etc.
demand: Command, or something which is given as if it was a command, needing much practice skill, effort, etc.
Challenge: Difficult, demanding or stimulating task.
Pressure: Influenced by urgency and compulsion, suffering stress.
Effort: Use of much strength and energy (to do something), enervative attempt, struggle.
Relaxation: Being less tight, stiff, anxious, worried or formal in manner, be at ease.
Anxiety: Troubled feeling in the mind caused by fear and uncertainty about the future.
Excitement: State of strong emotion and feeling of eagerness, happiness and nervousness especially one caused by something pleasant.
Boredom: State of feeling tired and uninterested by being dull or tedious.
Placidity: State of being pleasantly calm and peaceful, unruffled, tranquil, serene.
Anger: Strong feeling of displeasure and hostility.
Provocativeness: Tending or intended to arouse anger, annoyance, controversy, etc.
Sullenness: State of being silent, bad-tempered and gloomy.
Pride: Feeling of pleasure or satisfaction which one gets from doing something well; from owning something excellent or widely admired; form the knowledge of one's own worth or character, dignity and self-respect.
Humiliation: Feeling ashamed or disgraced; lower the dignity and self-respect of somebody.
Modesty: State of having or showing a not too opinion of ones abilities, qualities, etc.; not vain or boastful, rather shy, not putting oneself forward, bashful; state of having or showing a moderate or humble estimate of one's merit, importance, etc..
Shame: Painful feeling caused by wrong, dishonourable, improper or ridiculous behaviours by oneself.
Gratitude: Being grateful, thankfulness.
Resentment: Feel bitter, indignant or angry about something hurtful, insulting, etc.
Virtue: Moral goodness or excellence, that is having or showing better behaviour or higher moral principals than others.
Guilt: Anxiety or unhappiness caused by the knowledge of having done wrong.

Appendix 10: The Brief Symptoms Inventory (Derogatis & Melisaratos, 1983)

BSI

Name: _____ Patient No.: _____ Technician _____

Location: _____ Visit No.: _____ Mode: S-R _____ Nar ___

Age: _____ Sex: M ___ F ___ Date: ___ Remarks: _____

INSTRUCTIONS

Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select one of the numbered descriptors that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST .....INCLUDING TODAY. Place that number in the open block to the right of the problem. Do not skip any items, and print your print your number clearly. If you change your mind, erase your first number completely. Read the example below before beginning, and if you have any questions ask the technician.

EXAMPLE

HOW MUCH WERE YOU DISTRESSED BY:	Descriptors	Answer
EX. Body Aches.....	0 Not at all 1 A little bit 2 Moderately 3 Quite a bit 4 Extremely	Ex. ☐

HOW MUCH WERE YOU DISTRESSED BY:

1.	Nervousness or shakiness inside	☐	
2.	Faintess or dizziness	☐	
3.	The idea that someone else can control your thoughts	☐	
4.	Feeling others are to blame for most of your troubles	☐	
5.	Trouble remembering things	☐	
6.	Feeling easily annoyed or irritated	☐	
7.	Pains in heart or chest	☐	
8.	Feeling afraid in open spaces	☐	
9.	Thoughts of ending your life	☐	
10.	Feeling that most people cannot be trusted	☐	
11.	Poor appetite	☐	
12.	Suddenly scared for no reason	☐	
13.	Temper outbursts that you could not control	☐	
14.	Feeling lonely even when you are with people	☐	
15.	Feeling blocked in getting things done	☐	
16.	Feeling lonely	☐	
17.	Feeling blue	☐	
18.	Feeling no interest in things	☐	
19.	Feeling fearful	☐	
20.	Your feelings being easily hurt	☐	
21.	Feeling that people are unfriendly or dislike you	☐	
22.	Feeling inferior to others	☐	
23.	Nausea or upset stomach	☐	
24.	Feeling that you are watched or talked about by others	☐	
25.	Trouble falling asleep	☐	
26.	Having to check and doublecheck what you do	☐	
27.	Difficulty making decisions	☐	
28.	Feeling afraid to travel on buses, subways, or trains	☐	

29. Trouble getting your breath ☐

30. Hot or cold spells ☐

31. Having to avoid certain things, places, or activities because they frighten you ☐

32. Your mind going blank ☐

33. Numbness or tingling in parts of your body ☐

34. The idea that you should be punished for your sins ☐

35. Feeling hopeless about the future ☐

36. Trouble concentrating ☐

37. Feeling weak in parts of your body ☐

38. Feeling tense or keyed up ☐

39. Thoughs of death or dying ☐

40. Having urges to beat, injure, or harm someone ☐

41. Having urges to break or smash things ☐

42. Feeling very self-conscious with others ☐

43. Feeling uneasy in crowds ☐

44. Never feeling close to another person ☐

45. Speels of terror or panic ☐

46. Getting into frequent arguments ☐

47. Feeling nervous when you are left alone ☐

48. Others not giving you proper credit for your achievements ☐

49. Feeling so restless you couldn't sit still ☐

50. Feelings of worthlessness ☐

51. Feelings that people will take advantage of your if you let them ☐

52. Feelings of guilt ☐

53. The idea that something is wrong with your mind ☐

Symptoms Dimensions of the Brief Symptoms Inventory:

I-Psychoticism: 3-14-22-34-44-47-50-53 (8 items)

II-Somatization: 2-7-23-29-30-33-37 (7 items)

III-Depression: 9-16-17-18-20-35-50 (7 items)

IV-Hostility: 6-13-40-41-46 (5 items)

V-Phobic Anxiety: 8-28-31-42-43-47 (6 items)

VI-Obsessive Compulsive: 5-15-26-27-32-36 (6 items)

VII-Anxiety: 1-12-19-38-45-49 (6 items)

VIII-Paranoid Ideation: 4-10-21-24-48-51 (6items)

The Global Severity Index (GSI)

The Positive Symptom Distress Index (PSDI)

The Positive Symptom Total (PST)

Appendix 11: The Motivational Style Profile (Apter, Mallows & Williams, 1998)

Decide for each of the following descriptive phrases how far it applies to you. respond circle your answer on the scale below each item. Please do this for whole list of phrases, making sure that you have responded to every phrase w a circle.

1 *Never*

2 *Seldom*

3 *Sometimes*

4 *Often*

5 *Very often*

6 *Always*

Remember:
Circle the appropriate number

Try not to allow your feelings at this moment to sway your judgement, but make an estimate based on how you experience things in general. There are, of course, no right or wrong answers. Please try to be as careful and accurate as possible.

1. Like to be tranquil
1 2 3 4 5 6

2. Like to break rules
1 2 3 4 5 6

3. Like to feel powerful
1 2 3 4 5 6

4. Help other people succeed
1 2 3 4 5 6

5. Get worked up about things
1 2 3 4 5 6

6. Have fun
1 2 3 4 5 6

7. Welcome attention from others
1 2 3 4 5 6

8. Show determination
1 2 3 4 5 6

9. Do things which I consider are important
1 2 3 4 5 6

10. Feel rebellious
1 2 3 4 5 6

11. Help others to believe in themselves
1 2 3 4 5 6

12. Expect the best
1 2 3 4 5 6

13. Have intense feelings
1 2 3 4 5 6

1 *Never*

2 *Seldom*

3 *Sometimes*

4 *Often*

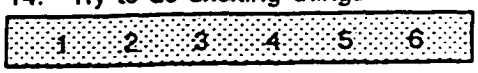
5 *Very Often*

6 *Always*

Remember:
Circle the appropriate number

Try not to allow your feelings at this moment to sway your judgement, but make an estimate based on how you experience things in general. There are, of course, no right or wrong answers. Please try to be as careful and accurate as possible.

14. Try to do exciting things



15. Attempt to fit in with others

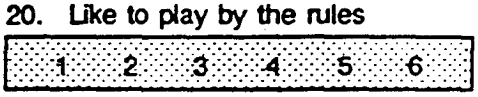
16. Try hard

17. Act provocatively

18. Relish competing with others

19. React emotionally to events

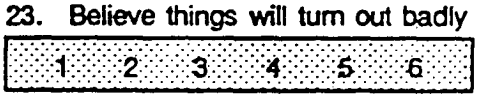
20. Like to play by the rules



21. Like to be liked

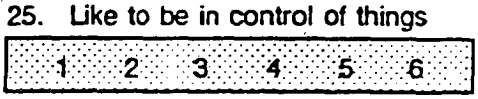
22. Am a good friend

23. Believe things will turn out badly

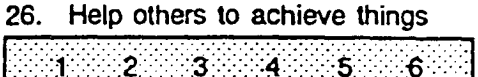


24. Work at things

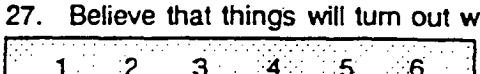
25. Like to be in control of things



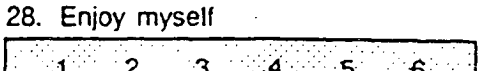
26. Help others to achieve things



27. Believe that things will turn out well



28. Enjoy myself



1 *Never*

2 *Seldom*

3 *Sometimes*

4 *Often*

5 *Very often*

6 *Always*

Remember:
Circle the appropriate number

Try not to allow your feelings at this moment to sway your judgement, but make an estimate based on how you experience things in general. There are, of course, no right or wrong answers. Please try to be as careful and accurate as possible.

29. Look for thrills
1 2 3 4 5 6

30. Worry about whether others like me
1 2 3 4 5 6

31. Work for distant goals
1 2 3 4 5 6

32. Avoid disagreements
1 2 3 4 5 6

33. Enjoy defying authority
1 2 3 4 5 6

34. Look for responsibility
1 2 3 4 5 6

35. Feel hopeful
1 2 3 4 5 6

36. Like to be attractive to others
1 2 3 4 5 6

37. Take the safe course of action
1 2 3 4 5 6

38. Feel emotions surging up within me
1 2 3 4 5 6

39. Do things for kicks
1 2 3 4 5 6

40. Avoid annoying others
1 2 3 4 5 6

41. Aim to be kind to others
1 2 3 4 5 6

42. Hate to feel unpopular
1 2 3 4 5 6

43. Give to those in need
1 2 3 4 5 6

1 *Never*

2 *Seldom*

3 *Sometimes*

4 *Often*

5 *Very often*

6 *Always*

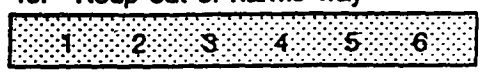
Remember:
Circle the appropriate number

Try not to allow your feelings at this moment to sway your judgement, but make an estimate based on how you experience things in general. There are, of course, no right or wrong answers. Please try to be as careful and accurate as possible.

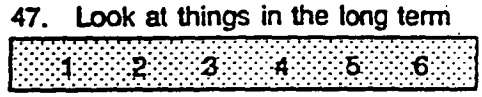
44. Get the feeling that I cannot cope

45. Plan ahead

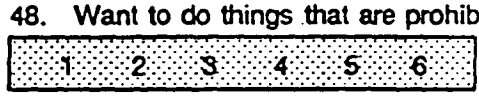
46. Keep out of harms way



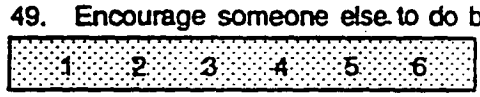
47. Look at things in the long term



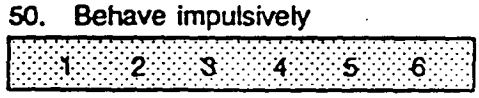
48. Want to do things that are prohibited



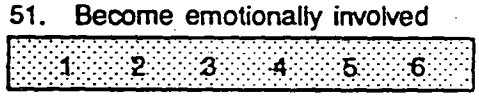
49. Encourage someone else to do better



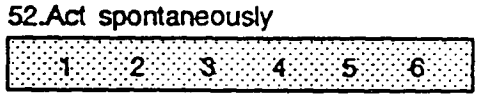
50. Behave impulsively



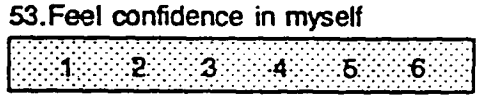
51. Become emotionally involved



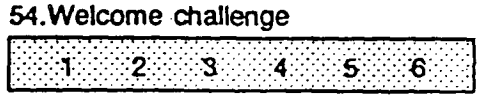
52.Act spontaneously



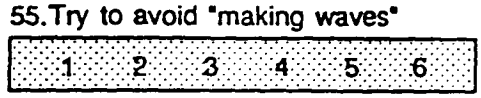
53.Feel confidence in myself



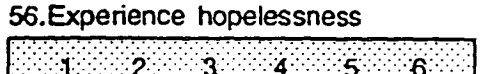
54.Welcome challenge



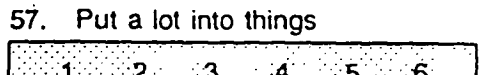
55.Try to avoid "making waves"



56.Experience hopelessness



57. Put a lot into things



1 *Never*

2 *Seldom*

3 *Sometimes*

4 *Often*

5 *Very often*

6 *Always*

Remember:
Circle the appropriate number

Try not to allow your feelings at this moment to sway your judgement, but make an estimate based on how you experience things in general. There are, of course, no right or wrong answers. Please try to be as careful and accurate as possible.

58. Ask myself whether I am making progress

1 2 3 4 5 6

59. Look for security

1 2 3 4 5 6

60. Try to behave assertively

1 2 3 4 5 6

61. Feel cheerful

1 2 3 4 5 6

62. Do what I want to do at that moment

1 2 3 4 5 6

63. Like to be adventurous

1 2 3 4 5 6

64. Aim to be considerate to others

1 2 3 4 5 6

65. Enjoy giving presents

1 2 3 4 5 6

66. Feel fed up

1 2 3 4 5 6

67. Drive myself hard

1 2 3 4 5 6

68. Show belief in someone else's abilities

1 2 3 4 5 6

69. Care what happens to others

1 2 3 4 5 6

70. Believe that fate is against me

1 2 3 4 5 6

Apter Motivational Style Profile

SUBSCALE ITEMS

MOTIVATIONAL STYLE					
1. SERIOUS (Telic)	9	31	45	47	58
2. PLAYFUL (Paratelic)	6	28	50	52	62
3. AROUSAL-AVOIDING	1	32	37	46	59
4. AROUSAL-SEEKING	14	29	39	54	63
5. DEFIANT (Negativistic)	2	10	17	33	48
6. COMPLIANT (Conformist)	15	20	40	55	64
7. SELF-CENTERED MASTERY (Autic Mastery)	3	18	25	34	60
8. SELF-CENTERED SYMPATHY (Autic Sympathy)	7	21	30	36	42
9. OTHER-CENTERED MASTERY (Alloic Mastery)	4	11	26	49	68
10. OTHER-CENTERED SYMPATHY (Alloic Sympathy)	22	41	43	65	69
MOTIVATIONAL TENDENCY					
11. OPTIMISM	12	27	35	53	61
12. PESSIMISM	23	44	56	66	70
13. EMOTIONALITY (Arousability)	5	13	19	38	51
14. EFFORTFULNESS	8	16	24	57	67

AMSP

SCORING SHEET

NAME: SEX: AGE: OCCUPATION:

SUBSCALES	ITEM SCORES					SUBSCALE TOTAL	DOMINANCE	SALIENCE
1- Serious						(a)	a-b=	a+b=
2- Playful						(b)		
3- Arousal-Avoiding						(c)	c-d=	c+d=
4- Arousal-Seeking						(d)		
5- Defiant						(e)	e-f=	e+f=
6- Complaint						(f)		
7- Self-Centered Mastery						(g)	g-h=	g+h=
8- Self-Centered Sympathy						(h)		
9- Other-Centered Mastery						(i)	i-j=	i+j=
10- Other-Centered Sympathy						(j)		
11- Optimism						(k)		
12- Pessimism						(l)		
13- Emotionality						(m)		
14-Effortfulness						(n)		

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